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Programmatic HAZWOPER Health and Safety Plan

Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling

Portland Harbor Superfund Site

AECOM Project Number:
60554349 Geosyntec Project Number: PNG0767

~~January 12~~~~February 22, 2018~~, 2018March 2, 2018

~~*PRIVILEGED AND CONFIDENTIAL / JOINT DEFENSE COMMUNICATION / ATTORNEY CLIENT WORK PRODUCT*~~

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~~Agency~~ EPA Review

~~February~~January~~M~~arch 2018

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Programmatic HAZWOPER Health and Safety Plan

Portland Harbor Superfund Site Pre-Remedial Design Investigation and Baseline Sampling

Willamette River
Portland, Oregon 97210

Prepared for:
Pre-RD AOC Group
Portland, Oregon

Prepared by:
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

Expiration Date (Max 1-Year from signature date)
~~January 12~~~~February 22, 2018~~March 2, 2018

Preparer
Linda Howard
Environmental Planner

~~December 19~~~~February 22~~March 2 ~~2017~~2018

Area/Regional SHEM
Fred Merrill, CSP
PNW Area Manager

~~December 21~~March 2~~February 22~~, ~~2017~~2018

Project Manager
Jennifer Pretare, Ph.D.
Project Manager

~~January 12~~March 2~~February 22~~, 2018

~~PRIVILEGED AND CONFIDENTIAL / JOINT DEFENSE COMMUNICATION / ATTORNEY CLIENT WORK PRODUCT~~

~~Agency~~ EPA Review

~~February~~January~~M~~arch 2018

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CERTIFICAT ION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

~~January 12~~~~February 22~~March 2, 2018

Kenneth M. Tyrrell
Project Coordinator
AECOM Technical Services

Date

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HASP SUMMARY

This Heal h and Safety Plan (HASP) document is considered a Programmatic HASP. HASP Addendums will be prepared for each of the ~~eight~~seven individual ~~Pre-Remedial Inves igation Studies~~Field Sampling Plans (FSPs) ~~described in the individual Field Sampling Plans (FSPs) that comprise the Project. These~~The HASP Addendums will be appended to this Programmatic HASP once the methodology for each FSP is approved.

The purpose of the HASP Addendums and accompanying documents (e.g., Pre-Job Hazard Assessment) is to analyze the job steps and safety requirements appropriate for each methodology as described in the FSP.

~~The HASP Addendums will include Pre-Job Hazard Assessments (Pre-JHAs), and other forms as needed for the specific ac ivitys described in the FSPs.~~

~~Table Note: This Summary is intended to provide key informa ion only and cannot be substituted for reading, understanding, and complying with he full HASP. This summary may be continually updated as tasks and personnel change.~~

Project Name:	Portland Harbor Superfund Site Pre-Remedial Design Inves igation Studies	Project Number:	60554349
Summary Revision Date:	~~January 11~~March 2~~February 23~~, 2018	Client Name:	Portland Harbor Pre-RD AOC Group
Report ALL SH&E Incidents, no matter how minor, to the Incident Hotline: 800-348-5046 **Injury, Property Damage, Vehicle, Security, Regulatory Inspection, Environmental Impact, and any potentially work related injury, discomfort/ pain, or damage.**			
Iden ify he nearest Occupational Clinic and Hospital to the study area that accepts AECOM Workers Compensa ion Insurance (see **Attachment A** for instructions). If the nearest such clinic or hospital is an unreasonable distance from the study area, identify nearer hospitals or clinics. Attach maps and directions to the clinics and hospitals in **Attachment A**.			
Occupational Clinic:	Adventist Health Occupational Medicine	Nearest Hospital:	Legacy Emanuel Medical Center
Address:	10201 SE Main Street Portland, OR 97216	Address:	2801 N Gantenbein Avenue Portland, OR 97227
Phone Number:	503.408.7010	Phone Number:	503.413.2200
Key Personnel			
Project Manager:	Jennifer Pretare, Ph.D.	Cell Phone:	(b) (6)
Supervisor (Field Coordinators):	Nicky Moody (AECOM) Keith Kroeger (Geosyntec) Jennifer Pretare (AECOM)	Cell Phone:	
Safety Officer:	Nicky Moody (AECOM) Keith Kroeger (Geosyntec) Jennifer Pretare	Cell Phone:	
AECOM SH&E Mgr.	Fred Merrill, CSP	Cell Phone:	
Client Project Manager:	Hans Feige	Cell Phone:	
List ALL Short-Service Employees, including subcontractors (<6 Months with Company in Current Area/Job Description) All short-service employees including subcontractors will be identified in the HASP Addendums.			
List ALL Subcontractors and their Safety Officers: ~~Project Specific~~All Subcontractors will be iden ified ~~HASPs will be prepared for each of the eight individual Pre-~~			

Commented [MF2]: Internal AECOM Comment - Please make sure this information is included as part of the HASP Addendum

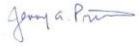
Commented [MF3]: Internal AECOM Comment - Please make sure this information is included as part of the HASP Addendum

Officers identified as of he preparation of this Programmatic HASP are listed below.

- Geosyntec: Alison Clements, 812.766.0888
- Gravity Marine: Shawn Hinz, 425.281.1471
- Global Diving and Salvage: Spencer McGinnis, 425.923.4693
- Ballard Marine Construction: Robert Stanton, 360.695.5163
- David Evans & Associates: (will be provided with the ~~Project-Specific HASP~~HASP Addendum prepared for he Ba hymetry Study)
- Oregon Bass and Panfish Club, a non-profit organization that may assist with catching fish for the fish tissue study and fish tracking study: (will be provided with the ~~Project-Specific HASP~~HASP Addendum prepared for the fish tissue study once it is confirmed whether they will par icipate in the study).

Project Manager (PM) must positively verify subcontractors are approved in Subport for the work described. If there were any limitations/conditions of approval, describe hem and how they are being met.

☒ I have verified hat all subcontractors are approved in Subport, and that all condi ions of approval are met.

PM Name Jennifer Pretare, Ph.D. PM Signature  Date ~~1-12-18~~2-22-2018~~3-~~ 2-2018

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ATTACHMENTS

Attachment A: Hospital/Clinic Maps and Incident Repor ing and Response Flow Chart

Attachment B: AECOM SH&E Field Applicable Procedures

Attachment C: Project and Activity Orientation Outline

Attachment D: Project/Task-Specific Pre-Job Hazard Assessments Forms

Attachment E: Daily Task Hazard ~~Analysis~~Assessment/Daily Tailgate Forms

Attachment F: ~~Spill Response Directive~~AED Program

Applicable References

This Health and Safety Plan (HASP) conforms to the regulatory requirements and guidelines established in the following documents:

- Title 29, Part 1910 of the Code of Federal Regula ions (29 CFR 1910), Occupational Safety and Health Standards (with special attention to Section 120, Hazardous Waste Operations and Emergency Response).
- Title 8 of he California Code of Regulations (8 CCR), with special attention to Section 5192 Hazardous Waste Operations and Emergency Response, and Section 3202, Injury Illness Prevention Program.
- 29 CFR 1926, Safety and Health Regulations for Construction.
- 8 CCR, wi h special attention to Sub Chapter 4, Sections 1500 - 1938 Construction Safety Orders.
- Na ional Ins itute for Occupational Safety and Health/Occupational Safety and Hazards Administration/U.S. Coast Guard/U.S. Environmental Protec ion Agency, Occupa ional Safety and Heal h Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115, 1985.
- The requirements in this HASP also conform to AECOM's Safety for Life Program requirements as specified in the AECOM Safety, Health, and Environment Manual.
- The purpose of this HASP is to address health and safety concerns related to AECOM-managed activities associated with the Pre-Remedial Investigation Studies located between river mile 1.8 and 28.4 on the Willamette River in Por land, Oregon. The specific roles, responsibilities, authority, and requirements as they pertain to the safety of employees and the scope of services are discussed herein. The document is intended to identify known potential hazards and to facilitate communication and control measures to prevent injury or harm. Additionally, provisions to control the potential for environmental impact from these activities are included where applicable.

1.0 INTRODUCTION

This Programma ic HASP is designed to identify, evaluate, and control safety and health hazards and to outline emergency response actions for AECOM-managed activities on the study area. Because development of Field Sampling Plans (FSPs) for the eight individual Pre-Remedial Design Investigation (PDI) Studies is an iterative process, detailed information regarding all field activities that may or will be conducted for each study is not currently available. Preliminary identification of field activities is included for the following studies on the Pre-Job Hazard Assessment forms included in Attachment D:

- Surface sediment sampling study
- Fish tissue study
- Surface water sampling study
- Subsurface sediment sampling study
- Fish acoustic tracking study
- Sediment trap study
- Porewater metals sampling study

Preliminary identification of field activities associated with the bathymetry study (to be conducted by David Evans & Associates [DEA], a subcontractor to AECOM) and activities that will occur at the on-shore sample processing facility will be appended to this HASP as the work plans for those ~~studies~~ tasks are developed.

Because study area-specific sampling locations, methods, media, and other detailed information are to be developed for each study, safety procedures specific to that field study will be documented as an addendum to this Programmatic HASP. Each HASP Addendum will be included as an attachment to the FSP prepared for the proposed field activity. Each HASP Addendum will provide the scope of work, detailed field maps, additional study area information, hospital route maps, safety hazards and control measures, requirements for personal protective equipment, work zone delinea ions, and key emergency contact information. Each HASP Addendum will be prepared and followed by the subcontractor contracted to perform the specific fieldwork for the PDI Studies. At a minimum, provisions outlined in the field contractor's HASP Addendum must be consistent with those outlined in his HASP.

This HASP must be kept on-site during work activities and made available to all workers, including subcontractors and other study area occupants for informational purposes. AECOM subcontractors are expected to independently to characterize, assess, and control study area hazards created by their specific scope of work.

This section of the HASP summarizes important AECOM SH&E Procedures that apply to all Design and Consulting Services (DCS) Americas jobs. See Attachment B for complete copies of applicable field SH&E Procedures. This template has been designed primarily for use in the United States.

1.1 APPLICABLE REFERENCES

This HASP conforms to the regulatory requirements and guidelines established in the following documents:

- Ti le 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910), Occupa ional Safety and Health Standards (with special attention to Section 120, Hazardous Waste Operations and Emergency Response).
- Ti le 8 of the California Code of Regulations (8 CCR), with special attention to Section 5192 Hazardous Waste Operations and Emergency Response, and Sec ion 3202, Injury Illness Preven ion Program.
- 29 CFR 1926, Safety and Health Regulations for Construction.

- 8 CCR, with special attention to Sub Chapter 4, Sections 1500 - 1938 Construction Safety Orders.
- National Ins itute for Occupational Safety and Health/Occupa ional Safety and Hazards Administration/U.S. Coast Guard/U.S. Environmental Protection Agency, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115, 1985.
- The requirements in this HASP also conform to AECOM's Safety for Life Program requirements as specified in he AECOM Safety, Heal h and Environment (SH&E) Manual.
- The purpose of this HASP is to address heal h and safety concerns related to AECOM-managed activities associated with he Pre-Remedial Design Investiga ion Studies to be conducted between river mile (RM) 1.8 and 28.4 (the study area) on the Willamette River in Portland, Oregon. The specific roles, responsibilities, authority, and requirements as they pertain to the safety of employees and the scope of services are discussed herein. The document is intended to identify known potential hazards and to facilitate communica ion and control measures to prevent injury or harm. Additionally, provisions to control the potential for environmental impact from these activities are included where applicable.

1.2 PROJECT ASSUMPTIONS

- This study area is an AECOM-controlled study area.
- Study management will assist in loca ing subsurface utilities, vessels, and structures located on the property and outside the scope of he utility locator service.
- No confined spaces will be entered on this project.
- No excavations will be entered.
- No lone workers will participate in the field sampling activities.
- Work will be performed during daylight hours.

Work crews will work 12-hour days, 5 days a week, for 2 mon hs (with 4 contingency days)

2.0 STUDY AREA INFORMATION AND SCOPE OF WORK

~~2.0~~2.1 STUDY AREA DESCRIPTION

The PDI study area encompasses the in-river portion of an approximately 27-mile stretch of he Willamette River within Portland Harbor, from approximately RM 1 9 to RM 28.4.

~~2.1~~2.2 SITE BACKGROUND/HISTORY

The Site extends from RM 1.9 near the mouth of he Willamette River to RM 11.8 (Figure 1). The Willamette River is a dynamic waterbody that originates within Oregon in the Cascade Mountain Range and flows approximately 187 miles north to its confluence with the Columbia River. The study area includes a water-dependent, highly industrialized area, which contains a multitude of facilities and bo h private and municipal outfalls. Land use along he Lower Willamette River in the Portland Harbor includes marine terminals, manufacturing and o her commercial and municipal opera ions, and public facilities, parks, and open spaces. The Downtown Reach, which includes the urbanized area of downtown Portland, is defined by the US Environmental Protection Agency (EPA) as extending from RM 11.8 to RM 16.6. EPA defines the Upstream Reach as extending from RM 16.6 to RM. For purposes of the PDI, the Work Plan is focusing on RM 1 9 to RM 28.4 for data collection to assess incoming contaminant loads to the Site. Collectively, the Downtown Reach and Upstream Reach are referred to as the Upriver Area for purposes of he PDI.

The shorelines along most of the Portland Harbor area have been developed for industrial, commercial, and municipal operations; he Portland Harbor area serves as a major shipping route for containerized and bulk cargo. In addition, the Portland Harbor area has historically received, and currently receives, discharges from industrial and municipal sources including point- and non-point sources that discharge to the Lower Willamette River.
Common shoreline features within the harbor include constructed bulkheads, piers, wharves, buildings extending over the water, and steeply sloped banks armored with riprap or other fill materials.

On December 1, 2000, the Site was listed on the National Priorities List by EPA mainly due to concerns about contamina ion in the sediments and the potential risks to human health and the environment from consuming fish. The most widespread contaminants found at the Site include, but are not limited to, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, dichlorodiphenyltrichloroethane and its derivatives, and dioxins/furans. A remedial inves iga ion and feasibility study was initiated in 2001 by a small subset of potentially responsible parties known as the Lower Willamette Group and completed by EPA in 2017.

~~2.2~~2.3 CLIENT OR THIRD-PARTY OPERATIONS AT STUDY AREA

Geosyntec (AECOM's teaming partner): Will provide on-board staff for the bathymetric study, surface sediment sampling, sediment coring, sediment traps, and porewater sampling to provide technical oversight and document the sampling process during survey activities.

Gravity Marine Services (Gravity): Will provide research vessels, equipment, and staff to conduct in-water sampling, including subsurface sediment sampling, surface sediment sampling, sediment traps porewater sampling, and fish tissue sampling, in addition to providing general research vessel support.

Global Diving and Salvage (Global Diving): Will support Gravity with a dive team for the sediment trap study.

Ballard Marine Construction (Ballard Marine): Will provide research vessels, equipment, and staff to support the fish acoustic tracking study.

HTI-Vemco: Will provide equipment and staff to support the fish acoustic tracking study.

DEA: Will provide research vessels, equipment, and staff to conduct the multi-beam bathymetry survey.

Oregon Bass and Panfish Club: Will provide angling support for the fish tissue and fish tracking study.

~~2.3~~2.4 SCOPE OF WORK

AECOM will mobilize staff primarily from the Portland, Oregon, and Seattle, Washington, offices to conduct in-water sampling in the Willamette River. Additional AECOM technical staff will travel from other locations. PDI Studies described below:

Bathymetry Study: DEA, using DEA research vessels, will conduct a multi-beam bathymetric survey of the en ire Site from RM 1 9 to 11.8 and down the Multnomah Channel to the Sauvie Island Bridge. The bathymetric survey will extend up the riverbanks to an elevation of 7.8 feet (16 NAVD88), the shoreward extent of the Site. Geosyntec will provide on-board staff to provide oversight and document he sampling process.

Surface Sediment Sampling Study: Surface (0 to 30 cen imeter) sediment samples at 659 locations will be collected via a Van Veen hydraulic power grab sampler operated from two aluminum research vessels (RV Cayuse [24-foot] and RV Tieton [26-foot]) operated by Gravity, a subcontractor to AECOM. All vessel operations and sediment sampling equipment will be operated by Gravity. Gravity will be responsible for operating the following equipment:

- Research vessel (RV Cayuse and RV Tieton)
- Van Veen power grab sampler

AECOM and Geosyntec staff will provide on-board oversight, document the sampling process, and conduct on- board sample processing of surface sediment samples. On-board sample processing will involve transferring sediment samples to a tub where the sample will be homogenized using a battery-operated hand drill and paint mixer, then transferring samples to smaller containers for transport to the on-shore processing facility for further sample processing, after which they will be shipped to the lab for analysis. Additional AECOM staff will conduct on-shore processing, packaging, and shipping of the samples at AECOM's on-shore facility.

It is assumed that work crews will work 12-hour days, 5 days a week, for 2 months (with 4 contingency days). A fatigue management plan will be created if he dura ion of work exceeds a 14-hour day.

Fish Tissue Study: One-hundred thirty-five [135] smallmouth bass (SMB) specimens will be collected using traditional hook and line angling by an AECOM field sampling team and contract anglers belonging to the Oregon Bass and Panfish Club. The sampling will be conducted from two aluminum research vessels owned and operated by Gravity. If he required number of specimens are not collected using his method, electrofishing will be used as a back-up. Each whole-body SMB specimen (no filleting required) will be weighed, measured, photographed, and packaged for analysis at the lab. Additional AECOM staff will conduct on-shore processing, packaging, and shipping of the samples at AECOM's on-shore facility. It is assumed that sampling will take approximately 20 days (two 10-day sessions).

Surface Water Sampling Study: Surface water samples will be collected at seven transects using a PR2900 HVS coupled with an XAD cartridge and a vortex separator, owned and operated by Gravity. The sampling equipment will be operated from two aluminum research vessels (RV Mazama [24-foot] and RV Me how [26-foot]) operated by Gravity, a subcontractor to AECOM. AECOM staff will provide on-board oversight, document the sampling process, and conduct on-board sample processing of surface water samples.

Sampling events will occur during the winter and summer. It is assumed that each vessel will average one transect per day during the late fall and winter sampling events, with shorter daylight hours, for a duration of 4 days. It is assumed that each vessel will average two transects per day during the summer sampling events, with longer daylight hours, for a duration of 2 days.

Subsurface Sediment Sampling Study: Samples at 90 locations will be collected via a Vibracore System operated from at least two aluminum research vessels (RV Cayuse [24-foot] and RV Tieton [26-foot]) operated by Gravity. All vessel operations and sediment sampling equipment will be operated by Gravity. Gravity will be responsible for operating the following equipment:

- Research vessels (RV Cayuse, RV Tieton)
- Vibracore
- Sawzall, to cut the sediment cores to manageable lengths
- Power drill, to drill a small hole in the sediment core to drain excess water out

AECOM staff will provide on-board oversight and document the sampling process. Additional AECOM staff will conduct on-shore processing of the samples at AECOM's on-shore facility.

It is assumed that each vessel will average four sampling locations per day, requiring 12 days to complete the sampling and 16 days to complete the sediment core processing.

Fish Acoustic Tracking Study: A fish tracking study will be performed to characterize the movement and home range of SMB within the study area. The design will consist of a series of gates and arrays of acous ic receivers mounted on fixed moorings placed on the river bottom. The receivers will capture movement of SMB that have been implanted with acoustic tags. Ballard Marine will provide vessel support to install the receivers. HTI-Vemco will support receiver deployment and tag implantation. Fish collection will be performed using rod and reel/hook and line, wi h support from he Oregon Bass and Panfish Club. A total of 40 tagged SMB are targeted for collection and tagging. Surgical tag implantation will be performed by experienced HTI-Vemco field biologists with assistance from AECOM biologists at a secure on-shore location.

It is assumed that receiver deployment and fish collection/tag implant will take 2 to 3 weeks.

Sediment Trap Study: Four sediment traps will be deployed upriver of the Site during three seasonal sampling events. The traps will be deployed at the same time as surface water sampling and then retrieved after a 3-month period. Each trap will consist of four glass cylinders placed in protective PVC sleeves. Commercial divers from Global Diving will mount the cylinders vertically to rebar or a pipe anchored in the river bottom such that the tops of he cylinders are 3 feet above the mudline. At retrieval, the divers will return to the traps, cap the glass cylinders, and transfer the cylinders to the vessel for processing. Once the processing is complete, the divers will return the glass cylinders to the PVC sleeves that remain fixed to he river bed. The sediment traps will be deployed and retrieved from research vessels owned and operated by Gravity.

Geosyntec will provide on-board staff to provide oversight and document the sampling process.

It is assumed that it will take 2 days to deploy the traps and 1-2 days for sampling and removal of the traps at the end of each sampling event.

Porewater Metals Sampling Study: Geosyntec will implement the background porewater metals (arsenic and manganese) investigation work by deploying dialysis equilibrium passive porewater samplers (referred to as "peepers") in the sediment bed in areas that are representative of background metals in porewater. Peepers include a glass or polyethylene vial covered with a 0.45-micrometer polyethersulfone membrane. The interior of a peeper vial consists of rows of chambers that are filled with distilled deionized water prior to deployment. During deployment, the deionized water approaches diffusive equilibrium with the porewater, over a 2- to 4-week period; the peepers are hen retrieved and he porewater is analyzed to determine concentrations of freely dissolved metals.

The peepers will be deployed using a newly developed push pole deployment system, with a marker and weighted retrieval line (thereby avoiding the need for divers). The peeper sampler is placed in an all-HDPE plas ic 3-D printed frame, inserted into the sediment surface using the push pole with mounted underwater camera, and secured to the sediment bottom using sand-bag weights. The peepers will be deployed and

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retrieved from research vessels owned and operated by Gravity. Geosyntec will provide on-board staff to provide oversight, operate the peeper deployment and retrieval, and document the sampling process.

It is assumed that it will take 2 days for reconnaissance to find suitable substrate conditions, 1 day for deployment, and 1 day for retrieval about 2 weeks later, plus 1 con ingency day. Peepers will be deployed in he summer during low flow conditions. Ten porewater samples will be analyzed (eight plus two QA/QC), along with a co-located sediment sample for comparative metals and conventional parameters.

~~2.4~~2.5 SCOPE OF WORK RISK ASSESSMENT

☐ Low Risk (examples: non-intrusive work, occasional exposure and/or low risk hazards)

☐ Medium Risk (examples: intrusive work, heavy equipment use, frequent exposure and/or moderate hazards)

☒ High Risk (examples: complicated scope, large/ multiple work crews, and/or constant exposure to hazards).

The following tasks/ hazards automatically trigger high risk ranking. Check all which apply. Include hazard mitiga ion procedures later in the appropriate Physical, Chemical, or Environmental section of he HASP.

☐ Asbestos removal/ contact	☐ Ordinance, Munitions, Explosives use
☐ ATV use	☐ Pile Driving
☐ Bridge/dam Inspections/ Snooper Truck use	☐ Radiation or Radioac ive Instrument use
☐ Confined Space	☐ Remote location or lone worker
☐ Cranes and Rigging use	☐ Respirator use (does not include dust mask)
☐ Demolition	☐ Scaffolding use
☒ Diving- scien ific or commercial	☒ Use or exposure to chemicals in excess to PEL or TLV values
☐ High speed traffic exposure	☐ Trenching/ Excavation
☐ Hot Work	☐ Tunnel/ Underground work
☐ Conditions Immediately Dangerous to Life or Heal h (IDLH)	☐ UXO/ MMR
☐ Laboratory Operations	☐ Work at Heights> 4ft.
☐ LOTO or Live Energy Source work	☐ Work at angle >30 deg.
☐ On-rail/ Near Rail work	☒ Work On/Over Water

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3.0 AECOM SAFETY, HEALTH, AND ENVIRONMENT PROGRAM

3.1 AECOM POLICY

Safety, Health and Environment Policy Statement

AECOM

Purpose

This policy establishes the framework to attain best-in-class Safety, Health and Environmental (SH&E) performance for AECOM's employees in the global marketplace.

Commitment

AECOM is committed to exceptional levels of performance in protecting its people and the environment. As stated in our Core Values, keeping our people safe is our most important measure of success. We strive to be the beacon of safety excellence in the industries and global communities in which we work.

To advance our SH&E program, we are committed to:

- Zero work-related injuries to AECOM employees and protection of the environment as a result of our activities.
- Providing a highly effective SH&E management system that drives continual review and improvement.
- Meeting client requirements and properly incorporating all safety, health and environmental rules and regulations at the local, state, provincial and national levels.
- Developing an exceptional safety culture where our people embrace ownership for the safety of themselves and others.
- Substantial improvements toward our goals of pollution prevention, resource conservation and environmental sustainability.
- Setting and meeting aggressive SH&E performance goals and Core Value Metrics to promote continuous improvement.
- Working with employees and business partners in order to continuously improve SH&E performance.
- Recognizing and celebrating those who contribute to excellent SH&E performance.
- Striving to make AECOM the provider of choice for the safe execution of design, build, finance, operate and maintenance work globally.

The commitment to this policy by the leadership, management and employees of AECOM provides the foundation for a safe workplace, operational excellence and long-term business success.

Expectations

Safety is a core value and a key to our success. We demand continuous improvement in our journey toward a zero incident culture, where everyone is committed to safety, health and environmental excellence.

To that end, we demand:

- Our leaders, managers, supervisors and employees demonstrate their commitment in their actions and decisions to assure that every person goes home safe every day.
- Our employees embrace safety as a core value both on and off the job.
- Each employee is committed to his/her own safety and that of his/her fellow employees.
- We will incorporate Life-Preserving Principles into our work planning and execution.
- We proactively and aggressively identify, manage and eliminate hazards in the workplace.
- We train and prepare our people to have the knowledge, skills, competency and equipment required to work safely.
- We stop our employees from working if the work cannot be executed safely or if conditions or behaviors on the work activity are unsafe.
- All employees immediately report safety, health and/or environmental incidents, near-misses, unsafe conditions, and at-risk behaviors to their supervisor; and that we diligently work to correct the problem.

Our SH&E expectations will be accomplished by the demonstrated leadership of management, compliance with regulatory requirements and participation of AECOM personnel.

Communication

This Policy will be reviewed annually to ensure it meets the needs of the company, and will be made available to all persons under the control of the company.

Sincerely:

M. Burke

04 March 2016
Date

Michael S. Burke
Chairman and Chief Executive Officer

3.2 SAFETY FOR LIFE

"Safety for Life" is a comprehensive integrated AECOM Safety Management System that drives our nearly 100,000 employees toward AECOM's commitment to achieving zero work- related injuries and/or illnesses; preventing damage to property and the environment; and maintaining an environmentally friendly and sustainable workplace. Our Safety for Life program is supported by nine Life Preserving Principles hat apply to all AECOM ac ivi ies.

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3.3 LIFE PRESERVING PRINCIPLES

Demonstrated Management Commitment
Our Executive, senior and project managers will lead the SH&E improvement process and continuously demonstrate support and commitment.

Employee Participation
Our employees will be encouraged and empowered to become actively engaged in our safety processes through their active participation in safety committees, training, audits, observations and inspections. Employees will be encouraged to participate in health initiatives and adopt a healthy lifestyle.

Budgeting and Staffing for Safety
Our safety staff will be competent, fully trained and qualified to provide technical resources to our internal and external clients. A budget to support safety activities will be included in project proposals.

Pre-Planning
Our design, engineering, project and construction management staff will deploy effective risk mitigation efforts to design, plan and build safety into every project. Pre-Project and Pre-Task planning will be an effective tool in protecting our employees and the environment.

Contractor Management
Our project staff will work closely with our sub-consultants, subcontractors, contractors and Joint Venture Partners to provide a safe work environment for employees and members of the public. Our goal of SH&E performance excellence will be equally shared by all project participants.

Recognition and Rewards
Our employees will be recognized for their efforts in working safely and their support of our safety efforts.

Safety Orientation and Training
Our employees will be provided with effective safety training in order to identify and mitigate hazards in the workplace to prevent injuries to themselves and others who may be affected by their actions.

Incident Investigation
Our managers and safety professionals will investigate all recordable incidents and serious near misses to identify contributing factors and root causes in order to prevent a reoccurrence. Lessons learned shall be identified, communicated and implemented.

Fit for Duty
Our employees are responsible to report to work each day fit for duty and not to pose a health and safety hazard to themselves or others.

3.4 DRIVING AND VEHICLE SAFETY

The proper operation of vehicles is critical to protec ing the safety of AECOM employees and subcontractors. Drivers face numerous hazards while operating vehicles. Some of the hazards include collision with another vehicle, collision wi h a fixed object, vehicle break down or failure, or falling asleep or becoming otherwise incapacitated while driving. All employees will adhere to Driving procedure S3AM-005-PR, which includes the following key practices:

- **Authorized Drivers** - Managers must au horize drivers following evaluation of driver criteria to drive and maintain an AECOM-owned, leased or rented vehicle, a client or customer-owned vehicle, or a personal vehicle operated in the course of conducting AECOM business.
- **Electronic Devices Prohibited** - AECOM prohibits use of all portable electronic devices while opera ing a motor vehicle/ equipment, which includes being stopped at a traffic light or stop sign. This includes cell phones, two-way radios, and other items whether hand-held or hands-free. Electronic devices include, but are not limited to, all mobile phones, pagers, iPods, MP3s, GPS, DVD players, tablets, laptops, and other portable electronic devices that can cause driver distrac ion. Hands-free device use is not allowed.

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  - GPS units and devices used for navigation may only be used if factory installed or secured to he vehicle with a bracket that allows the driver to view the image without having to take their eyes off the road. Electronic devices shall be setup for operation prior to commencing driving ac ivi ies and shall not be changed by the driver while driving.

- **Vehicle Inspections -** The driver shall conduct pre-trip vehicle inspections prior to each trip. A vehicle inspection checklist, S3AM-005 FM2, can be used to guide and document the inspection process. Vehicle inspection is to include a 360-degree walk around and visual inspection under the vehicle for leaks and obstructions prior to moving the vehicle.
- **Training -** All drivers shall complete defensive driver training. Additional training (i.e., hands-on defensive driver training) may apply for medium and high-risk drivers; see Driving procedure S3AM-005- PR and SHE Training procedure S3AM-003-PR for more details.
- **Journey Management Plan -** Drivers who undertake trips in excess of 250 miles (400 kilometers) one way, drive in remote or hazardous areas, or when otherwise deemed necessary, shall develop and document a Journey Management Plan using S3AM-005-FM1 or equivalent.
- **Secure Loads -** Cargo is only to be carried within the passenger compartment of a vehicle when segregated and restrained to prevent objects from becoming distractions, obstructions, or projectiles to occupants should emergency vehicle maneuvers be required (e.g., harsh braking or crash). All goods transported on flatbed trucks or in pickup beds must be securely fastened to prevent them from becoming hazards. All applicable laws and regulations regarding securing of loads must be met. It is prudent to check the load after a few miles to ensure that load has not shifted or loosened prior to completing the remainder of he trip.
- **Backing Up -** Reversing the vehicle is to be avoided ~~if at all possible~~if possible. If backing up is necessary, use the following guidelines:
  - Use a spotter at all times when backing a vehicle.
  - Pre-plan all vehicle movements.
  - If the pull-through me hod of parking is not possible, drivers will scan parking spot/area for hazards and back in; thereby, facilitating departure where the first move is forward.
  - A light tap of the horn should be used to alert others of your intention to back up.
  - Avoid tight spaces.
  - Vehicles over 10,000 pounds gross vehicular weight are required to have a competent spotter in place when backing. A competent spotter is one that has received spotter training.
  - All vehicles shall have a competent spotter in place when backing in an active work zone. Parking and public access areas are recommended but not required to have a spotter.

3.5 FITNESS FOR DUTY

One of AECOM's nine Life-Preserving Principles is Fitness for Duty (see Fitness for Duty procedure S3AM-008- PR). Fitness for Duty means that individuals are in a state (physical, mental, and emotional) hat enables them to perform assignments competently and in a manner that does not threaten the health and safety of themselves or others. On certain projects or for specific tasks, fit for duty cer ifications may be requested of medical providers by SH&E Managers or Human Resources (HR). Employees should report to work fit for duty and unimpaired by substances or fa igue. Supervisors must observe their employees and work with the employee, SH&E staff, and HR to address deficiencies. AECOM will not tolerate retaliation against any employee for filing a complaint or concern regarding their fitness for duty or participating in any way in an investigation.

3.5.1 Medical Surveillance

AECOM's S3AM-128-PR, Medical Screening and Surveillance, details the requirements to participate in a medical monitoring program. Medical Surveillance provides a streamlined process to determine if employees meet the physical requirements to perform assigned duties as defined by applicable regula ions. It is also designed to provide a means to collect data relevant to exposure to chemical and physical agents for the protection of the workers and to confirm the effectiveness of health and safety programs.

3.5.2 Fatigue

One aspect of fit for duty is fatigue management. AECOM has developed procedures that limit work periods or require additional rest under certain circumstances, including during long-distance travel or when working at high altitudes. These procedures also set limits on extended work periods of 14 hours per day or 60 hours per week. A fatigue management plan is required if longer working hours are necessary (see Fatigue Management Procedure S3AM-009-PR).

3.5.3 Substance Abuse

Drug and alcohol abuse pose a serious threat to the health and safety of employees, clients, and the general public as well as the security of our job sites, equipment, and facilities. AECOM is committed to the elimination of illegal drug use and alcohol abuse in its workplace and regards any misuse of drugs or alcohol by employees to be unacceptable. AECOM Substance Abuse Prevention Procedure (S3AM-019-PR) prohibits the use, possession, presence in the body, manufacture, concealment, transportation, promotion, or sale of the following items or substances on company premises. Company premises refer to all property, offices, facilities, land, buildings, structures, fixtures, installations, aircraft, automobiles, vessels, trucks and all other vehicles and equipment - whether owned, leased, or used.

- Illegal drugs (or their metabolites), designer and synthetic drugs, mood or mind-altering substances, and drug use related paraphernalia unless authorized for administering currently prescribed medication;
- Controlled substances that are not used in accordance with physician instructions or non-prescribed controlled substances; and
- Alcoholic beverages while at work or while on anycustomer- or AECOM-controlled property.

This policy does not prohibit lawful use and possession of current medication prescribed in the employee's name or over-the-counter medications. Employees must consult with heir health care provider about any prescribed medication's effect on their ability to perform work safely and disclose any restrictions to their supervisor.

Although some states may pass laws legalizing medical or recreational marijuana use, the use, sale, distribution, and possession of marijuana are violations of federal law and AECOM policy and will subject an employee to disciplinary action up to and including termination in accordance with controlling law.

3.6 HAND SAFETY

The hands are exposed to hazards more than any body part. SH&E Hand Safety Procedure S3AM-317-PR describes requirements and best practices including these notable practices:

- **All personnel shall have gloves in their immediate possession 100%** of the time when in a shop or on a work location. Gloves that address the hazard shall be worn when employees work with or near any materials or equipment that present the poten ial for hand injury due to sharp edges, corrosives, flammable and irrita ing materials, extreme temperatures, splinters, etc. Use the Gloves Needs Assessment (S3AM-317-FM1) to help determine the appropriate glove for the hazard(s).

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- **Fixed open-blade knives are prohibited** from use ~~during the course of~~during AECOM work. Examples of fixed open-blade knives include pocket knives, mul i-tools, hunting knives, and standard utility knives. For more information about cutting tools, see S3AM-317-ATT1, Safe Alternative Tools.

3.7 HAZARD COMMUNICATION

Hazardous materials that may be encountered as existing environmental or physical/health contaminants are listed in Section 8.1, Potential Chemical Hazards, and will be further addressed in he ~~Project Specific HASP~~HASP Addendums that will be appended to this Programma ic HASP. Their properties, hazards, and associated required controls will be communicated to all affected staff and subcontractors in accordance with the requirements of AECOM Procedure S3AM-115-PR1 Hazardous Materials Communication including these key elements:

- All personnel shall be briefed on the hazards of any chemical product they use and shall be aware of and have access to the Safety Data Sheets (SDS).
- All containers shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

In addition, any employee or organization (contractor or subcontractor) intending to bring any hazardous material onto this AECOM-controlled study area must first provide a copy of the item's SDS to the Supervisor or Safety Officer for review and filing. The Supervisor or Safety Officer will maintain copies of all SDS on-site and in Project-Specific HASPs appended to this HASP. SDS may not be available for locally obtained products, in which case an alternate form of product hazard documentation will be acceptable.

3.8 HAZARDOUS MATERIAL HANDLING AND WASTE MANAGEMENT

If hazardous, solid, and/or municipal wastes are generated during any phase of the project, the waste shall be accumulated, labeled, and disposed of in accordance with applicable Federal, State, Provincial, Territorial and/or local regulations and SH&E Procedure S3AM-116-PR, Hazardous Materials Shipping. A project-specific Entity Letter may be required for the project/client; if so, only persons named on the entity letter are allowed to sign waste shipping papers "***on behalf of [Pre-RD AOC Group]***." Any individual signing shipping papers must have valid Department of Transportation and Resource Conservation and Recovery Act (RCRA) training for waste shipment. Consult the HZM/HZW & TDG page on Ecosystem or the SH&E Manager for further guidance on AECOM and regulatory procedures and training requirements.

3.9 HOUSEKEEPING AND PERSONAL HYGIENE

Basic housekeeping requirements for offices and work areas, as well as personal hygiene and sanitation standards, can be found in S3AM-013-PR, Housekeeping. Inspections should be performed at the regular interval specified below. The housekeeping inspection form S3AM-013-FM1 is available for use.

Complete the table below regarding project-specific Housekeeping and Personal Hygiene requirements:

Housekeeping: Inspection Frequency: twice a day	**Inspector:** Designated Safety Officer for individual study (to be designated in ~~Project Specific~~ HASP Addendums)
Eating, Drinking, Smoking: Eating and drinking of non-alcoholic beverages permitted on research vessels in areas designated by the vessel operator. No smoking or alcoholic beverages allowed on research vessels.	

Handwashing: Water, soap, and paper towels or equivalent supplies are located TBD. Project staff will wash hands and face after comple ing work activities and prior to breaks or meals.
Toilets: Some of Gravity's research vessels have toilets. Public restrooms and shower facilities are also available at the Swan Island boat launch.
Water: Bottled water will be provided by AECOM, Geosyntec, or subcontractor Field Coordinators aboard vessels. A water supply meeting the following requirements will be utilized: *Potable Water* - An adequate supply of potable water will be available for field personnel consump ion. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Disposable drinking cups for single use and a waste receptacle will be provided as needed. Water containers will be refilled daily and disinfected regularly. Potable water containers will be properly identified in order to distinguish them from non-potable watersources. *Non-Potable Water* - Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked wi h a label stating ***"Non-Potable Water, Not Intended for Drinking Water Consumption"***
Illumination will be provided in the form of natural light.

3.10 LONE WORKER

~~There will be n~~No lone workers will participate ~~on~~ in the field sampling tasks for this project. AECOM discourages employees from working alone (i.e., where AECOM personnel are out of visual and audio range of others) when performing field tasks. Lone workers may conduct activities at the on-shore sample processing facility when other employees are not present. Any employee working alone at the on-shore processing facility will complete a Task Hazard Assessment (THA) prior to starting work each morning, and will adhere to AECOM's lone worker policies and procedures (see SH&E Procedure S3AM-314-PR, Working Alone).

3.11 SAFETY OBSERVATIONS

Safety observations are observations made by employees and subcontractors of a condition or behavior that could contribute to an incident, prior to the incident occurring. Observations can also identify positive behaviors or interventions which contribute to the prevention of incidents. Large, long-term projects may benefit from the use of LifeGuard to track and trend observations on a program level. All other projects should log their observations using IndustrySafe. Both reporting systems can be accessed on any safety page of ecosystem, or the QR codes below can be used while off the AECOM network from a smartphone/device.

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3.12 SHORT SERVICE EMPLOYEE

A Short Service Employee is an employee with fewer than 6 months experience working on field projects or an employee who has not completed the required training or received required certifications (see the Short Service Employee procedure, S3AM-002-PR). The Project Manager will identify all Short Service Employees working on the project, and each Short Service Employee will be assigned to an experienced team member so all ac ivi ies may be monitored. Short Service Employees shall be easily identified in he field environment, such as by wearing a specific-colored hardhat or applying a manufacturer-approved orange stripe to their hardhat, or be clearly identified by some other system. Any new employee shall wear the designated Short Service Employee identifier until the Project Manager determines he employee has the knowledge, skills, and ability related to the specific hazard on he project.

3.13 STOP WORK AUTHORITY

AECOM empowers and expects all employees to exercise their Stop Work Au hority (see Stop Work Authority Procedure S3AM-002-PR) if an incident appears imminent, or when hazardous behaviors or conditions are observed. A stop work request can be informal if the situa ion can be easily corrected, or may require shut ing down operations if revised procedures are necessary to mitigate the hazard. If an AECOM employee observes an imminently hazardous situation on a study area controlled by others (i.e., a client-managed contractor), the employee can always stop work for hemselves by removing themselves from he situation. Employees also may attempt to stop work to avoid allowing the contractor to come to harm by immediately notifying he contractor foreman or project engineer, or if necessary, the client or party managing the contractor.

No employee should object to the issuance of a stop-work request, nor can any disciplinary action be levied against the employee. All employees must agree that the situation has been mitigated before resuming work. No employee will be disciplined for refusing to work if they feel it is unsafe.

3.14 COLD WEATHER AND COLD WATER CONDITIONS FOR ON-WATER WORK

The majority of this program will occur on research vessels over water, during all times of the year. Because of the unique conditions that may be encountered in the study area and the physical nature of the work, a summary is provided here for he use of personal flotation devices (PFDs) and thermal protection under a variety of water and air temperature regimes. Additional information is provided in AECOM SH&E Procedure S2NA-112-Cold Stress and S2NA-315-Working on and Near Water in ~~Appendix~~ Attachment B.

3.14.1 Cold Stress Prevention Plan:

Cold wea her conditions are considered those conditions below a Wind Chill Temperature of 50 degrees Fahrenheit (10 degrees Celsius). Working in a marine environment increases hypothermic risk due to the moisture content in he air. Recognizing the increased risk for exposure to hypothermia in cold weather conditions, the project will establish the following minimum working temperature thresholds:

		Air Temperature (including wind chill)		
		>50°F	50°F to 40 °F	<40 °F
Water Temperature	>50°F	USCG Type III PFD.	USCG Type III PFD.	Stop Work
	50°F to 45 °F	USCG Type III PFD.	Mustang survival suit	Stop Work
	44°F to 40 °F	Mustang survival suit	Mustang survival suit	Stop Work
	< 40 °F	Stop Work	Stop Work	Stop Work

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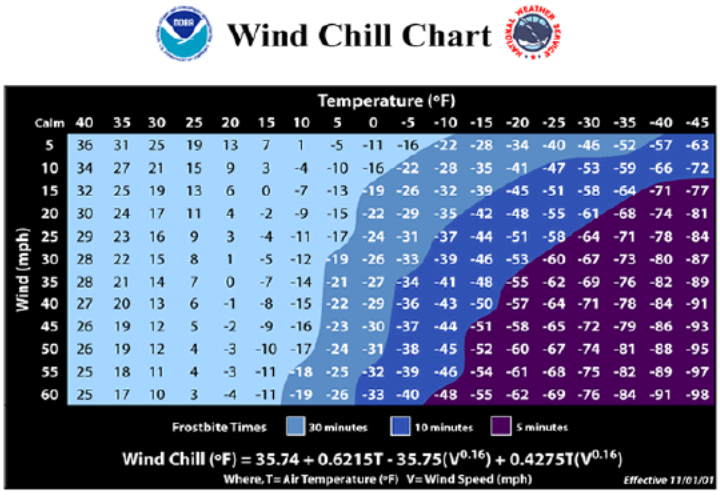
Notes:

- Assumes AECOM staff or subcontractors are not exposed to significant potential of falling into water. Significant poten ial of falling into water can be defined as placing one's body beyond the life line or outer boat railing while performing job duties. Boarding/off boarding at the dock is not included in this definition and assumes all boarding/off-boarding is performed after the vessel has been secured at the dock.
- Assumes rescue of man-over-board (MOB) can be performed within 3 minutes.
- Assumes no ice or snow conditions are occurring or are forecasted to occur during the days of on-water work.
- Stop Work occurs when the water or air temperature (including effects of wind chill) are below the 40 degrees Fahrenheit threshold. Work will resume after the temperature threshold is met or exceeded.
- For air temperatures below 50 degrees Fahrenheit, personnel should dress in layers and shall not use cotton as base layer as it reduces insula ion capabilities when wet. All personnel shall have a set of dry clothing.
- The Wind Chill Chart Below can be used to determine the effects of wind speed on temperature. Additional information is contained within ~~Appendix~~ Attachment B, AECOM SH&E Procedure S2NA-112-Cold Stress.



Additional Training

Employees and subcontractors who will be exposed to cold weather conditions will watch a training video on the physiological effects of cold water immersion found at: http://www.coldwaterbootcamp.com. Training completion will be documented prior to the commencement of the field activities and will be stored in the project files.

A MOB drill will be performed at the commencement of water work activities to assess MOB recovery activities.

Additional Personal Protective Equipment (PPE)

PPE that will be worn during cold weather conditions below 50 degrees F include but are not limited to the following:

- Three layers of non-cotton clothing; examples include down, wool, or other synthetic materials to provide insulation when wet
- Outer layer to break the wind
- Hat or hardhat liner
- Insulated footwear
- Gloves that allow for insulation and dexterity; hand warmers will also be provided

4.0 ROLES AND RESPONSIBILITIES

Roles and responsibili ies for the project team are defined in SH&E Procedure S3AM-209-PR, Safe Work Standards and Rules. The Project Manager is ultimately responsible for the development of this HASP and establishing a budget to implement the controls and training required. The PM is also responsible for ensuring that the plan is implemented, that appropriate documentation is generated, and hat records are maintained. The SH&E Manager is responsible for reviewing and approving this HASP and assis ing with other SH&E matters upon request. A Safety Officer may be appointed to oversee implementation of the HASP in the field. All project team members are responsible for reviewing and abiding by this HASP, performing daily (or more frequent) ~~task hazard assessment~~THAs, stopping work when necessary to correct unsafe behaviors or conditions, and reporting incidents promptly to the Project Manager and AECOM Incident Reporting Hotline (Incident Hotline 800-348- 5046).

4.1 SH&E MANAGER AND SAFETY OFFICER: FRED MERRILL, CSP

Mr. Merrill is the Safety, Health and Environment (SH&E) Area Manager for the Pacific Northwest of the AECOM Design and Consulting Services – Americas. He is a Certified Safety Professional (CSP #30431) serving approximately 400 employees, spanning five states (Alaska, Washington, Oregon, Idaho, and Montana). Mr. Merrill works as part of an integrated AECOM SH&E team to assist and collaborate with AECOM senior management in maintaining and improving AECOM's robust SH&E culture and to minimize operational losses, occupational health problems, ~~accidents~~accidents, and injuries. Mr. Merrill also maintains the following trainings and certifications:

- Safety Trained Supervisor Construction (Board of Certified Safety Professionals STSC)
- Occupational Safety and Health Administration (OSHA) 30-Construction Safety and Health
- 40-hour OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Training
- 8-hour OSHA HAZWOPER Refresher Training
- 8-hour OSHA HAZWOPER On-Site Manager/Supervisor Training
- Community Emergency Response Team (CERT) Training

Mr. Merrill will serve as the program's Safety Officer. In this role, his essential duty is to review tasks associated with individual studies and assign a qualified Safety Supervisor.

The Safety Officer supports the Supervisor in providing a safe work environment. Not all studies will have a designated Safety Officer; the decision should be made by the Project Manager and SH&E Manager, taking into considera ion the complexity and risks of the scope of work. The Supervisor may act as the Safety Officer on sites without one. The Safety Officer's responsibilities include the following:

- Approve the type (full time, collateral duty, alternates) and qualifications (training and years of experience) of Safety Supervisors per the requirements of each task.
- Updating the study area-specific HASP to reflect changes in condi ions or the scope of work. HASP updates must be reviewed and approved by he SH&E Manager.
- Inspecting the study area for compliance with this HASP and the SH&E Procedures using the appropriate field audit inspection checklist found in IndustrySafe.
- Coordina ing with the Supervisor to review JSAs and THAs with the work crew.

- Assisting as needed to report incidents and verify that incidents and observations are logged into Lifeguard or IndustrySafe.
- Working with the Supervisor and Project Manager to develop and implement correc ive action plans to correct deficiencies discovered during Site inspec ions. Deficiencies will be discussed with project management to determine appropriate correc ive action(s).
- Contac ing he SH&E Manager for technical advice regarding safety issues.
- Determining emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation.
- Checking that all personnel and visitors have received the proper training, ~~orienta ion~~orienta ion, and medical clearance prior to entering the study area.
- Establishing controlled work areas (as designated in his HASP or other safety documentation).
- Facilita ing or co-leading daily tailgate meetings and maintaining attendance logs and records.
- Discussing potential SH&E hazards with the Site Supervisor, the SH&E Manager, and the Project Manager.
- Selecting an alternate Safety Officer by name and informing him/her of their duties, in the event that the Safety Officer must leave or is absent from the study area.
- Verifying that all operations are in compliance with the requirements of this HASP.
- Issuing a “Stop Work Order” under the conditions set forth in this HASP.
- Temporarily suspending individuals from field activities for infractions against the HASP pending considera ion by the SH&E Manager and the Project Manager.

4.2 PROJECT MANAGER: JENNIFER PRETARE

The Project Manager has overall management authority and responsibility for all study area opera ions, including safety. The Project Manager will provide the Supervisor with work plans, staff, and budgetary resources, which are appropriate to meet the safety needs of the project operations. Some of the Project Manager's specific responsibili ies include the following:

- Verifying that personnel to whom this HASP applies, including AECOM subcontractors, have received a copy of it, with ample opportunity to review the document and to ask questions.
- Providing the concurring SH&E Manager with updated informa ion regarding conditions at the study area and the scope of study area work if changes occur that will affect the accuracy of this HASP.
- Providing adequate authority and resources to the Supervisor or Safety Officer to allow for the successful implementation of all necessary SH&E Procedures.
- Maintaining regular communications with the Supervisor or Safety Officer and, when necessary, the AECOM Client SH&E Program Manager.
- Coordina ing the activities of AECOM subcontractors and ensuring that they are aware of the pertinent health and safety requirements for these projects, when applicable.

- Conducting Safety System Auditing by way of Management Visits and/or Project Manager Self Assessments on a regular basis.
- Approving amendments to the HASP (in conjunction with the Supervisor or Safety Officer).
- Coordina ing activities with the client as needed to ensure the safe implementation of this HASP.

4.3 SAFETY SUPERVISOR (FIELD COORDINATORS): NICKY MOODY, KEITH KROEGER, JENNIFER PRETARE

The Safety Supervisor (Field Coordinator) has the overall responsibility and authority to direct work operations at the job site according to the provided work plans and HASP. The three primary Safety Supervisors are an icipated to be Nicky Moody, Keith Kroeger, and Jennifer Pretare. Additional Safety Supervisors may be designated by Fred Merrill as needed, based on evaluation of the study tasks and qualifications of personnel. The Project Manager may act as the Safety Supervisor while on-site. The Safety Supervisor's responsibilities include he following:

- Discussing deviations or drift from the work plan with the Safety Officer and Project Manager.
- Discussing safety issues with the Project Manager, Safety Officer, and field personnel.
- Assisting the Safety Officer with the development and implementation of corrective actions for study area safety deficiencies.
- Assisting the Safety Officer with the implementation of this HASP and ensuring compliance.
- Assisting the Safety Officer with inspections of the study area for compliance with this HASP and applicable SH&E Procedures.
- Reviewing Job Safety Analyses (JSAs) and ~~Task Hazard Assessments (~~THAs~~)~~ with the work crew.
- Reporting incidents and ensuring incidents and observations are logged into Lifeguard or IndustrySafe.
- Verifying that all operations are in compliance with the requirements of this HASP and halting any activity that poses a potential hazard to personnel, property, or the environment.
- Temporarily suspending individuals from field activities for infractions against the HASP pending considera ion by the Safety Officer, the SH&E Manager, and the Project Manager.

4.4 EMPLOYEES

Responsibilities of employees associated with this project include, but are not limited to:

- Understanding and abiding by the SH&E Procedures specified in the HASP and other applicable safety policies and clarifying those areas where understanding is incomplete.
- Providing feedback to SH&E management for continuous improvement relating to omissions and modifications in the HASP or other safety policies and procedures.
- Notifying the Supervisor or Safety Officer of unsafe conditions and acts.
- Stopping work if here is doubt about how to safely perform a task or if unsafe acts or conditions are observed (including subcontractors or team contractors).

- Speaking up and refusing to work on any study or opera ion where the SH&E procedures specified in this HASP or other safety policies are not being followed.
- Contac ing he Safety Supervisor or Safety Officer or the SH&E Manager at any ime to discuss potential concerns.

4.5 SUBCONTRACTORS

The requirements for subcontractor selec ion and subcontractor safety responsibilities are outlined in AECOM Procedure S3AM-213-PR, Subcontractor Management. Each AECOM subcontractor is responsible for assigning specific work tasks to their employees. Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required personnel protective equipment (PPE) and all required training.

AECOM considers each subcontractor to be an expert in all aspects of he work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services as well as all other requirements applicable to their work. Each subcontractor is expected to perform its operations in accordance wi h its own unique safety policies and procedures, ~~in order to~~to ensure that hazards associated with the performance of he work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to AECOM for review prior to the start of on-site activities.

Hazards not listed in this HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the AECOM Project Manager or the Supervisor prior to beginning work operations. The Supervisor or au horized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the study area for failure to comply with established health and safety procedures or for operating in an unsafe manner.

AECOM will have the following subcontractors on-site. Each subcontractor will prepare a HASP addressing the field activities for which they are responsible and will submit these to AECOM for review. Subcontractor HASPs will be appended to this Programmatic HASP.

Geosyntec (AECOM's teaming partner): Will provide on-board staff for he bathymetric study, surface sediment sampling, sediment coring, sediment traps, and porewater sampling to provide oversight and document the sampling process during survey activities.

Gravity: Will provide research vessels, equipment, and staff, including dive crew, to conduct in-water sampling, including subsurface sediment sampling, surface sediment sampling, sediment traps and porewater sampling, and fish tissue sampling, in addi ion to providing general research vessel support.

Global Diving: Will support Gravity with a dive team for a sediment trap study.

Ballard Marine: Will provide research vessels, equipment, and staff to support the fish acoustic tracking study.

HTI-Vemco: Will provide equipment and staff to support the fish acoustic tracking study.

DEA: Will provide research vessels, equipment, and staff to conduct a multi-beam bathymetry survey.

Oregon Bass and Panfish Club: May provide support for catching fish for the (SMB tissue sampling study).

4.6 VISITORS

Authorized visitors (e.g., client representatives, regulators, AECOM management staff, etc.) requiring entry to any work location on the study area will be briefed by the Project Manager, Supervisor, or Safety Officer on the hazards present at that location. Visitors will be escorted at all times at the work loca ion and will be responsible for compliance with their employer's health and safety policies. In addi ion, this HASP specifies the minimum acceptable qualifications, training, and PPE hat are required for entry to any controlled work area; visitors must comply with these requirements at all times.

If the visitor requires entry to any exclusion zone (EZ), but does not comply with the above requirements, all work ac ivities within the EZ must be suspended.

Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

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5.0 TRAINING AND DOCUMENTATION

The following sections describe the standard practices or programs that AECOM will establish to prepare employees to perform work safely and consistent with AECOM policy and procedures.

5.1 HASP/SITE ORIENTATION

The Project Manager shall conduct a Project/Site-specific HASP orientation prior to the start of field operations, with support as needed by the SH&E Manager, Safety Officer, or Supervisor. This meeting will involve representatives from all organizations with a direct contractual relationship with AECOM on he job site. Minimum items to be covered are listed in **Attachment C**. Participants will then sign the HASP Personnel Acknowledgement register at the end of the HASP.

5.2 DAILY TAILGATE MEETINGS AND TASK HAZARD ASSESSMENT REVIEW

The Supervisor, Safety Officer, or designee shall facilitate a tailgate meeting to discuss the specific requirements of this HASP, review the applicable JSAs, and/or complete THAs prior to the commencement of daily project ac ivi ies. Attendance at the daily tailgate meeting is mandatory for all employees and subcontractors at the Site contracted to AECOM. Simultaneous operations are encouraged to attend each other's tailgate meetings or at the very least the supervisors shall discuss the coordination of activities and associated hazards of each other's tasks. The supervisor will then convey the information to the work crew. The Tailgate Meeting must be documented by the Supervisor or Safety Officer on a Daily Tailgate Meeting form, a blank copy of which is included in **Attachment E**.

5.3 WORKER TRAINING AND QUALIFICATIONS

All personnel at this study must be qualified and experienced in he tasks they are assigned. SH&E Training Procedure S3AM-003-PR establishes the general training requirements for AECOM employees. In addition, S3AM-117-PR, Hazardous Waste Operations, explains the HAZWOPER training, and S3AM-128-PR, Medical Screening and Surveillance, details the medical surveillance requirements.

Check all required training on the table below. Verify training records of employees and ~~subcontractors~~ subcontractors.

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Table 5.1.1 Site-Specific Training Requirements

HAZWOPER Activities			
Activity	**Medical Surveillance**	**Training**	**Applies to**
Sediment trap collection/sampling Surface sediment collection/sampling Subsurface sediment collection/sampling All sediment handling in processing laboratory Porewater collection/sampling	Yes	☒ HASP Orienta ion	All Employees and Subcontractors
		☒ Boat Safety Orientation	All Employees and Subcontractors performing project
		☒ HAZWOPER 40-hour HR	All Employees and Subcontractors working in he exclusion and contamination reduction zones On-
		HAZWOPER 8-hour refresher	All Employees and Subcontractors working in he exclusion and contamination reduction zones-
		☒ HAZWOPER Supervisor	Employees managing others in HAZWOPER activities
		Fit Test/ Respiratory Protec ion	Employees needing to wear respirators
		Hazardous Materials Shipping	Employee responsible for shipping HZM/HZW/DG and/or signing
		Man overboard Training	All Employees and Subcontractors performing project work on a vessel
		Cold weather training	All Employees and Subcontractors performing project work in cold work environments-
		Fa igue Management	All Employees and Subcontractors
Non-HAZWOPER Activities			
Activity	**Medical Surveillance**	**Training**	**Applies to**
Fish Tracking Fish Tissue Sampling Ba hymetric Survey	No	HASP Orientation	All Employees and Subcontractors
		Boat Safety Orienta ion	All Employees and Subcontractors performing project work on a vessel
		Man overboard Training	All Employees and Subcontractors performing project work on a vessel
		Cold weather training	All Employees and Subcontractors performing project work in cold work environments-
		Fa igue Management	All Employees and Subcontractors

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Site-Specific Training Requirements	
Training	Applies to
	manifests
☒ Annual Medical Surveillance/ Clearance	Employees working in an exclusion zone and the regulatory required exposure limit is exceeded for 30 or more days a year
Biennial Medical Surveillance/ Clearance	Working in an exclusion zone more than 30 days a year and the regulatory required exposure limit is not exceeded
☐ OSHA 10 Hr Construction	Employees working near heavy equipment
☐ OSHA 30 Hr Construction	Supervisor/Safety Officer overseeing work with heavy equipment
Local requirements: Man-overboard Training	All Employees and Subcontractors performing project work on a vessel
Client requirements: Cold Weather Training	All Employees and Subcontractors performing project work on a vessel

5.3.1 Competent Person

A competent person is an employee who, through education, trainingtraining, and experience, has knowledge of applicable regulatory requirements, is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt correc ive measures to eliminate them.

AECOM's Competent Person Designation Procedure, S3AM-202-PR, explains the roles, responsibilities and procedures of naming a competent person. Complete he table below and include a S3AM-202-FM1 Competent Person Designation Form for each AECOM competent person (subcontractors to use an equivalent process).

These activities require a competent person. Mark all hat apply and list the name of the person.

	Activity	Name of Person
☒	Safe Vessel Operation, including motoring, docking, and operation of sediment and surface water sampling equipment	Gravity Captains: Mike Duffield, Rene Trudeau, Peter Jenkins, John Schaefer. Gravity Deckhands/Scientists: Shawn Hinz, Jeff Wilson, Jeff Schut, Chad Furulie, Edward Sloan. Ballard Marine: *To be identified in the Project Specific HASP Addendum.* DEA: *To be identified in Project Specific HASP Addendum*
☒	Diving	Global Diving: *To be identified in Project Specific HASP Addendum*
☒	Electrofishing	AECOM: *To be identified in Project Specific HASP Addendum*.

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6.0 HAZARD ASSESSMENT AND CONTROL

AECOM has adopted an approach to hazard assessment and control that incorporates bo h qualitative and quantitative methods to identify hazards and the degree to which they may impact employees and AECOM operations. See S3AM-209-PR, Risk Assessment and Management, for details regarding AECOM's process. This approach involves the following:

6.1 SH&E PROCEDURES

All AECOM SH&E procedures, in their controlled copy version, are available on the internal SH&E Policy and Procedures ecosystem page. Programmatic procedures referenced in his document (for example SH&E Training) do not need to be printed for inclusion in this HASP. Only procedures that are needed for field ac ivity reference and application MUST be printed in full and included in this HASP. The applicable field procedures checklist is in the Physical Hazards sec ion below, and procedures are included in **Attachment B**.

6.2 PRE-JOB HAZARD ASSESSMENT/JOB SAFETY ANALYSIS

A pre-job hazard assessment or JSA is to be developed for each discrete task planned as part of the project. This assessment lays out the steps of the job, poten ial hazards, and mitigation measures. Form S3AM-209-FM4 or a client-required equivalent may be used. A blank copy is included in **Attachment D**.

6.3 TASK HAZARD ASSESSMENT

The THA is a handwritten field form based on "Stop and Think" that is the first thing you do before starting work ac ivities, often paired with the daily tailgate meeting or work permit issuance. Not all risks can be an icipated in this HASP or the pre-job hazard assessment process; therefore, the THA is used to assess, mitigate, and document the study area-specific conditions and changes to he hazard profile prior to and throughout the work task. Proper implementation of the THA program protects worker health and safety. A blank THA form is included in **Attachment D**. The THA must be signed by all employees each day and initialed whenever a changed condition provokes a change in hazard controls.

6.3.1 Hazard Categories

JSAs and THAs should include consideration of the following hazard categories when iden ifying hazards and task specific controls:

- Energy Sources (line of fire, electricity, pressure, compression/tension)
- Fall (slip/trip, fall to same level, fall from height)
- Contact with (struck against, struck by, contact with sharp/abrasives)
- Caught (in, under, between, by)
- Strain/Overexertion (lifting, repetition, push/pull, bending, twisting)
- Exposure (temperature, radiation, noise, chemicals, radiation, hazardous atmosphere)

6.4 4-SIGHT

When preparing hazard assessments and throughout the day, workers should use 4-Sight. This is a mental process through which workers ask themselves (and each other) four questions designed to effectively assess hazards. Using these questions during each task, especially those without formal JSAs or THAs, will help workers iden ify hazards and condition changes so that they can control them or stop work to seek assistance.

1) What am I about to do?
2) What could go wrong?
3) What could be done to make it safer?
4) What have I done to communicate the hazards?

7.0 PHYSICAL HAZARD ASSESSMENT

7.1 PHYSICAL HAZARDS

A physical hazard is a hazard hat threatens the physical safety of an individual; contact with the hazard typically results in an injury. The following table summarizes the physical hazards or activities containing physical hazards present at the study area and the associated procedures that address protection and prevention of harm.

All checked procedures MUST be included in Attachment B for implementation and reference. Check all applicable hazards/ activities and add description of the hazard.

	Hazard/ Activity (note: text in this column links to procedure)	Description	Applicable Procedure
☐	Abrasive Blasting		S3AM-335-PR
☐	Aerial Work Platforms		S3AM-323-PR
☐	All-Terrain Vehicles		S3AM-319-PR
☐	Blasting and Explosives		S3AM-336-PR
☐	Bloodborne Pathogens		S3AM-111-PR
☐	Cofferdams		S3AM-344-PR
☒	Cold Stress	Open water and during winter months	S3AM-112-PR
☐	Compressed Air Systems and Testing		S3AM-337-PR
☐	Compressed Gases		S3AM-114-PR
☐	Concrete Work		S3AM-338-PR
☐	Confined Spaces		S3AM-301-PR
☐	Corrosive Reac ive Materials		S3AM-125-PR
☒	Cranes and Lifting Devices (vessel mounted A-frame)		S3AM-310-PR
☐	Demoli ion		S3AM-339-PR
☒	Diving (scientific and commercial)	Open water between; locations to be determined.	S3AM-334-PR
☐	Drilling, Boring & Direct Push Probing		S3AM-321-PR
☐	Electrical Safety		S3AM-302-PR
☐	Excavation		S3AM-303-PR
☐	Fall Protection		S3AM-304-PR
☐	Flammable and Combustible Liquids		S3AM-126-PR
☐	Gauge Source Radiation		S3AM-122-PR
☒	Hand and Power Tools	Aboard research vessel	S3AM-305-PR
☒	Hazardous Waste Operations	Aboard research vessel while handling sediment and surface water	S3AM-117-PR
☒	Heat Stress	Open water during summer months	S3AM-113-PR

☐	Heavy Equipment		S3AM-309-PR
☐	High Altitude		S3AM-124-PR
☐	Highway and Road Work		S3AM-306-PR
☐	Hoists Elevators and Conveyors		S3AM-343-PR
☐	Hot Work		S3AM-332-PR
☐	Ladders		S3AM-312-PR
☐	Lockout Tagout		S3AM-325-PR
☐	Machine Guarding Safe Work Practice		S3AM-326-PR
☒	Marine Safety and Vessel Operations	Willamette River from RM 1.8 to RM 28.4	S3AM-333-PR
☐	Material Storage		S3AM-316-PR
☐	Mine Site Activities		S3AM-341-PR
☐	Mining Operations		S3AM-345-PR
☐	~~Non Ionizing~~Non-Ionizing Radiation		S3AM-121-PR
☐	Overhead Lines		S3AM-322-PR
☐	Powder-Actuated Tools		S3AM-327-PR
☐	Powered Industrial Trucks		S3AM-324-PR
☐	Radiation		S3AM-120-PR
☐	Railroad Safety		S3AM-329-PR
☐	Respiratory Protection		S3AM-123-PR
☐	Scaffolding		S3AM-311-PR
☐	Steel Erection		S3AM-340-PR
☐	Temp. Floors, Stairs, Railings, Toe-boards		S3AM-342-PR
☐	Underground Utilities		S3AM-331-PR
☐	Underground Work		S3AM-330-PR
☐	Wildlife, ~~Plants~~Plants, and Insects		S3AM-313-PR
☐	Working Alone		S3AM-314-PR
☒	Working On and Near Water	On-board research vessel	S3AM-315-PR

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8.0 CHEMICAL HAZARD ASSESSMENT

AECOM will perform tasks that can expose personnel to a variety of hazards due to the operational activities, physical conditions of the work locations, and potential presence of environmental contaminants. This section presents a variety of potential chemical hazards, exposure pathways, and related mitigation actions. See S3AM- 110-PR, Toxic and Hazardous Substances, for information on planning, training, monitoring, and details on several specific chemicals (benzene, cadmium, chromium, hydrogen sulfide, lead, and silica).

8.1 POTENTIAL CHEMICAL HAZARDS

Table 8.1 SSummary of Hazardous Properties of Contaminant Exposure Hazards
IP: Ionization Poten ial
PEL: OSHA Permissible Exposure Limits TLV: Threshold Limit Values (American Conference of Governmental Industrial Hygienists [ACGIH])

	Chemical Name	Maximum Concentration Found On-Site	Media	Primary Routes of Exposure	PEL	TLV	IP electron volts (eV)
METALS							
☒	Arsenic	132 mg/kg 143 mg/kg 0.75 µg/L 77 µg/L	Sediment Soil Surface Water Pore Water	Dermal	0.01 0.05 mg/m^3	0.2 0.5 mg/m^3	n/a
☒	Cadmium	44 mg/lkg 26 mg/kg 36 µg/L	Sediment Soil Pore Water	Dermal	0.005 mg/m^3	0.5 01 mg/m^3 Respirable Fraction: 0.002 mg/m^3	n/a
☒	Chromium	1.92 µg/L 147 µg/L	Surface Water Pore Water	Dermal	1 0.5 mg/m^3	0.5 mg/m^3	n/a
☒	Copper	3,290 mg/lkg 13,300 mg/kg 3.68 µg/L 182 µg/L	Sediment Soil Surface Water Pore Water	Dermal	1.0 mg/m^3	1.0 mg/m^3	n/a
☒	Lead	13,400 mg/lkg 4,160 mg/kg 166 µg/L	Sediment Soil Pore Water	Dermal	0.05 mg/m^3	0.05 mg/m^3	n/a
☒	Manganese	66,200 µg/L	Pore Water	Dermal	5 mg/m^3	0.2 mg/m^3	n/a
☒	Mercury	65 mg/kg 19 mg/kg	Sediment Soil	Dermal	0.1 mg/m^3	0.025 mg/m^3	n/a
☒	Vanadium	379 µg/L	Pore Water	Dermal	0.05 mg/m^3	0.05 mg/m^3	n/a
☒	Zinc	9,000 mg/lkg 9,470 mg/lkg 68 µg/L 983 µg/L	Sediment Soil Surface Water Pore Water	Dermal	15 mg/m^3	10 10 mg/m^3	n/a
PESTICIDES							

	Chemical Name	Maximum Concentration Found On-Site	Media	Primary Routes of Exposure	PEL	TLV	IP electron volts (eV)
☒	2,4-5-TP (Silvex)	22 µg/L	Porew-Water	Dermal	None	None	n/a
☒	2,4-D	0.97 µg/L	Porew-Water	Dermal	10.0 mg/m^3	10.0 mg/m^3	n/a
☒	aldrin	1,340 µg/kg	Sediment	Dermal	0.25 mg/m^3	0.25 mg/m^3	n/a
		0 005 µg/L	SufaceSurface Water				
☒	dieldrin	356 µg/kg	Sediment	Dermal	0.25 mg/m^3	0.25 mg/m^3	n/a
☒	Lindane/ gamma BHC	430 µg/kg	Sediment	Dermal	0.5 mg/m^3	0.5 mg/m^3	n/a
		22 µg/L	Porew-Water				
☒	DDx, DDD, DDE, DDT*	3,600,000 µg/kg	Sediment	Dermal	1 mg/m^3	0.5 mg/m^3	n/a
		150 µg/kg	Soil				
		0.02 µg/L	Surface Water				
		5.7 µg/L	Porew-Water				
☒	Chlordanes	2,300 µg/kg	Sediment	Dermal	0.5 mg/m^3	0.5 mg/m^3	n/a
		0 002 µg/L	Surface Water				
☒	Hexachlorobenzene	14,000 µg/kg	Sediment	Dermal	None	0.002 mg/m^3	n/a
		22 µg/kg	Soil				
		0 007 µg/L	Surface Water				
☒	MCPP	34 µg/L	Surface Water	Dermal	None	None	n/a
VOCs and Semi-VOCs							
☒	1,1-DCE	283 µg/L	Porew-Water	?Inhalation	None	?None	10.00
☒	cis-1,2-DCE	574,000 µg/L	Porew-Water	?Inhalation	200 ppm	200 ppm	9.65
☒	Benzene	8,200 µg/L	Porew-Water	Inhala ionInhalation	1 ppm	0.5 ppm	9.24
☒	Chlorobenzene	30,000 µg/L	Porew-Water	Inhala ion?	75 ppm	0.510 ppm	9.07
☒	Ethylbenzene	11.4 µg/L	Surface Water	Dermal Inhala ionInhalation	100 ppm	20 ppm	8.77
		905 µg/L	Porew-Water				
☒	Bis-(2-E hylhexyl)phthalate (DEHP)	440,000 µg/kg	Sediment	Inhalation?	5 mg/m^3	5 mg/m^3	9.64
		27,000 µg/kg	Soil				
		64 µg/L	Surface Water				
☒	Tetrachloro-e hylene (PCE)	12,000 µg/L	Porew-Water	Inhala ionInhalation	100 ppm	25 ppm	9.32
☒	Trichloroethylene (TCE)	585,000 µg/L	Porew-Water	InhalationInhalation	100 ppm	10 ppm	9.45
☒	Toluene	821 µg/L	Porew-Water	Inhalationl phalation	200 ppm	20 ppm	8.82
☒	Vinyle Chloride	28,900 µg/L	Porew-Water	Inhalation?	1 ppm	?1 ppm	9.99
☒	Xylene	1,430 µg/L	Porew-Water	Inhalationl Inhalation	100 ppm	100 ppm	8.44, 8.56
OTHER CONTAMINANTS OF CONCERN							

	Chemical Name	Maximum Concentration Found On-Site	Media	Primary Routes of Exposure	PEL	TLV	IP electron volts (eV)
☒	Cyanide	23 mg/L	Porew-Water	Inhalation	5 mg/m^3	5 mg/m^3	13.60
☒	Dioxins/furans	66 µg/kg	Sediment	Inhalation	n/a	n/a	9.19/8.89
		0.0022 µg/kg	Soil				
		0.0000009 µg/L	Surface Water				
		0.000013 µg/L	Porew-Water				
☒	PAHs, total	53,000,000 µg/kg	Sediment	Inhalation	0.2 mg/m^3	0.2 mg/m^3	n/a
		600,000 µg/kg	Soil				
		605 µg/L	Surface Water				
		21,000 µg/L	Porew-Water				
☒	Polychlorinated biphenyls (PCBs)	37,000 µg/kg	Sediment	Absorption, ingestion	1 mg/m^3 (42% chlorine); 0.5 mg/m^3 (54% chlorine)	1 mg/m^3 (42% chlorine); 0.5 mg/m^3 (54% chlorine)	n/a
		1,020 µg/kg	Soil				
		0.02 µg/L	Surface Water				
☒	Perchlorate	210,000 µg/L	Porew-Water	2Dermal Inhalation	None	None	n/a
☒	TPH-Diesel	28,800 µg/L	Porew-Water	Inhalation	n/a	15 ppm100 mg/m^3	n/a
☒	Tributyltin	90,000 µg/kg	Sediment	Dermal	None	None	n/a
		9,470 µg/kg	Soil				
		0.004 µg/L	Surface Water				
☒	Dioxins/furans		Water, sediment	Inhala ion and ingestion	n/a	n/a	9.19/8.89
☒	PDBEs		Water, sediment, fish	Ingestion and inhalation	None	None	n/a

* Exposure limits based on DDT.

** Exposure limits based on chlordane. No PELs are set for alpha or gamma chlordane.

"None" is listed where there isare no established values in OSHA or ACGIH.

	Chemical Name	Maximum Concentration Found On Site	Media	Primary Routes of Exposure	PEL	TLV	IP electron volts (eV)
☒	Perchlorate		surface water, GW		None	None	n/a

8.2 POTENTIAL EXPOSURE PATHWAYS

Occupational exposure to chemical hazards associated with he work activities could potentially occur by two primary routes (inhalation and skin contact) and one indirect route (incidental inges ion).

8.2.1 Inhalation

Due to he wet sediment, inhalation hazard is not expected to be a high risk.

Constituents that poten ially pose an occupational concern to employees by the inhalation route are carbon volatile organic compounds (VOCs) and potentially semi-volatile organic compounds (SVOCs) when handling sediment on the vessel and in the processing laboratory. VOCs are also present in porewater samples; however, porewater sampling is considered a closed system where porewater is not exposed to the ambient air. In the event of a failure of the closed system (e.g., leak or residual sediment found on sampling device), exposure is limited by sample size and known/expected a ion concentration of contaminants in porewater. Air monitoring procedures are outlined in Section 8.4 monoxide from boat exhaust and residual volatile organic compounds. Air monitoring will not be performed due to the low risk of inhalation hazards controlled by the saturated sediment.

8.2.2 Skin Contact

Personnel handling residual product or waste and associated equipment may be exposed to chemical hazards by skin contact or adsorption. However, exposure is expected to be limited since workers will be required to wear appropriate PPE (i.e., appropriate work gloves, body clothing, and/or face shield).

8.2.3 Ingestion

Personnel handling residual product or waste and associated equipment, including project hazardous materials, may be exposed by incidental ingestion. Typically, this exposure occurs if proper PPE was not used or personal hygiene was not practiced. Personal protection against exposure via ingestion can be accomplished by performance of proper decontamina ion procedures when exiting contaminated work areas, as well as using he correct PPE.

8.3 DECONTAMINATION

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities. Decontamination steps are outlined in Hazardous Waste Operations procedure S3AM-117-PR. Some key elements are as follows:

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- All persons and equipment entering the EZ shall be considered contaminated, and thus, must be properly decontaminated prior to exiting to clean areas of the study area. These EZ areas are identified in two locations:
  - Immediate area surrounding the collection of sediment (this will incorporate a portion of the sampling vessel deck). This will also be the location where the sediment will be stored. This loca ion will be identified during the morning tailgate mee ing.
  - Laboratory processing area where samples are processed and stored for laboratory shipment.

- Avoid reactions between the solutions and contaminated materials. Review the applicable SDS.
- All contaminated PPE and decontamination materials shall be contained, stored, and disposed of in accordance with requirements determined by management.
- Use caution while working around decontamination stations, including the decontamination pad, which may be a slip or trip hazard.
- Use disposable equipment when possible and practical.

- All employees performing equipment decontamination shall wear the appropriate PPE outlined in he Pre-Job Hazard Assessments to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protec ion, such as face-shields and splash suits, and knee protectors.
- All decontaminated equipment shall be visually inspected for contamination prior to leaving the Contaminant Reduction Zone.

Decontamina ion procedures and equipment, equipment for decontamination procedures, and waste handling for decontamination will be identified in the Project-Specific HASP Addendums that will be appended to this Programmatic HASP.

8.4 AIR MONITORING

Monitoring shall be performed within he work area on--site in order toto detect the presence and relative levels of toxic substances. The data collected hroughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be in accordance with Exposure Monitoring Procedure S3AM-127-PR and specified in the work permit and/or JSAs for the tasks. Key elements of the procedure include:

- Calibration of monitoring equipment and/or daily bump tests to verify calibrations and confirm alarm function.
- Personal monitoring and result evaluation must be directed by a Cer ified Industrial Hygienist or Certified Safety Professional.

Real--Time Exposure Measurement/ Equipment

Monitoring shall be performed within he work area on--site in order to detect the presence and relative levels of toxic substances. The data collected hroughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be conducted as specified in he work permit and JSAs as work is performed. All instrumentation need to be rated intrinsically safe to prevent fire or explosion.

Table 8.2 Air Monitoring Instrumentation

	Instrument	Manufacturer/Model	Substances Detected
☒	Photo Ioniza ion Detector (PID)	RAE Systems mini-RAE Photovac Microtip HNu Model Hnu (min. 10.6 eV bulb)	• Petroleum hydrocarbons • Organic Solvents
☒	Chip Monitoring System for specific chemical detection	Drager CMS	• Specific compounds if PID indicates presence above action level and after consul ing with AECOM SH&E Lead and AECOM CIH

Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigation actions to limit, etc) must be implemented prior to commencing activities at the specific work area.

Personnel should also be able to upgrade or downgrade their level of protection with he concurrence of Site Supervisor or Site Safety Officer or the Safety Manager.

Reasons to upgrade:

- Known or suspected presence of dermal hazards;
- Occurrence or likely occurrence of gas, vapor, or dust emission; or
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

Reasons to downgrade:

- New information indicating that the situation is less hazardous than was originally suspected;
- Change in site conditions that decrease the potential hazard; or
- Change in work task that will reduce exposure to hazardous materials.

Monitoring Procedures

The monitoring procedures shown below are general guidelines for sampling ac ivities. The reviewing SH&E Manager may modify any or all of these for site-specific application. A reading in excess of an action level outlined below will require additional ventilation for 30 minutes, followed by re-monitoring.

Table 8.3 Tasks Requiring Air Monitoring, Procedures, and Action Levels

Tasks requiring air monitoring	Parameter	Zone Location and Monitoring Interval	Action Level	Response Action
Sediment Trap Collection on vessel Surface sediment Collection on vessel Subsurface sediment collection Sediment sampling in processing laboratory.	~~Volatile Organic Compounds (~~VOCs~~)~~ and volatile hydrocarbons (total by PID)	Breathing zone. – continuously during tasks where exposure to VOCs and volatile hydrocarbons is possible	< 5 ppm	Con inue monitoring;. may continue work in required ~~PPE.~~ PPE.
			5- 25 ppm (sustained for 5 minutes)	STOP WORK and notify PM. Investigate the cause of elevated VOC measurements and iden ify measures to reduce concentra ions (cover impacted soils, ven ilation, etc.). Work activities shall only continue once levels have decreased to or below 5 units above background. If levels continue above 5 units, the team shall contact the Project Manager, Project SH&E Lead to report the change of conditions. Perform air monitoring for benzene using compound specific meter (by PID with benzene specific separation tube, Drager CMS Benzene meter or equivalent device).
			≥ 25 ppm (sustained for 5 minutes)	Cease work, exit, and contact the Site Safety Officer, Site Supervisor and Project Manager.
	Benzene (by PID with benzene-specific separation tube or equivalent device)	Breathing zone. – continuously where 5-25ppm (sustained for 5 minute) action level is reached.	> 0.25 ppm	Cease work, exit the area, and contact the Site Safety Officer, Site Supervisor, and Project Manager.

~~Air monitoring will not be completed during the field work. Volatile compounds are not a contaminant of concern in the sediment at the project location.~~

9.0 ENVIRONMENTAL IMPACT PREVENTION

AECOM strives to avoid or control environmental impacts from our operations through planning and implementation of best practices as well as preparing responses to react to environmental incidents. Environmental Compliance procedure S3AM-204-PR provides details on permitting and planning requirements.

	Potential Environmental Impact	Description of hazard and permit or control being implemented
☐	Air Emissions	
☒	Hazardous Waste Management	Storage, treatment, or disposal of hazardous waste at the study area, RCRA Part B permits or equivalent, 90-day storage procedures, etc.
☐	Storm Water Pollution	
☐	We lands	
☐	Critical Habitat	
☐	O her:	

9.1 INCIDENTAL SPILL PREVENTION AND CONTAINMENT

Spill prevention and containment planning must be conducted and appropriate control measures established, consistent with regulatory requirements. Personnel are not expected to perform a response action related to an uncontrolled release of a hazardous substance. However, in the event of an incidental release of a hazardous material, a response will be performed to absorb, neutralize, or otherwise control the release within the immediate work area. Procedures contained in he SDS of the hazardous material will be implemented to perform the response. The Emergency Response section of this HASP contains information on spill repor ing, pre- and post- spill evaluation, and response.

9.1.1 Spill Prevention and Containment Practices

Work ac ivities may involve the use of hazardous materials (i.e., fuels, solvents) or work involving drums or other containers. When these activities exist, the procedures outlined below will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers and labelled.
- Tops/lids will be placed back on containers after use.
- Containers of hazardous materials will be stored appropriately away from moving equipment.
- Containers shall only be lifted using equipment specifically manufactured for that purpose.
- Drums/containers will be secured and handled in a manner that minimizes spillage and reduces the risk of musculoskeletal injuries.

- Equipment will be inspected daily for signs of leaks, wear, or strain on parts that, if ruptured or broken, would result in a spill.
- Refueling should occur in designated areas where incidental spills can be prevented from reaching permeable ground surfaces or surface water.
- Whenever possible, position parked or stationary equipment over secondary containment and/or absorbent materials to prevent spills from reaching permeable ground surfaces.
- A spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e., speedy dri, absorbent pads, etc.) will be available on the project study area and positioned for quick and easy access.

10.0 PERSONAL PROTECTIVE EQUIPMENT

PPE is considered the last line of defense in hazard control. PPE is meant to protect workers when all other methods (elimination, engineering, and administrative) have been exhausted. All employees must be trained in the proper use and maintenance of PPE. See Procedure S3AM-208-PR, Personal Protective Equipment.

A PPE assessment (see S3AM-208-FM1) can be performed to help determine PPE requirements. Pre-Job Hazard Assessments (Pre-JHAs) will ~~specify~~specify what PPE is required for each activity and where. ~~PPE upgrades for individual tasks or steps of a task are to be identified in JSAs or THAs.~~ The

Minimum Required PPE ~~(~~per AECOM PPE and HAZWOPER Procedure~~s c)~~ (where applicable):

- Hard hats will be required when working in areas with overhead hazards or where poten ial energy is stored and the release of it could be hazardous, (e.g. working on the vessel near lines/cables under tension, when winching, using A-Frames, sediment sampling, etc.).
- Safety glasses w/ side shields (may be clear or shaded).
- Sturdy work boots shall be worn at all times. The crew shall wear safety toe work boots ~~W~~whenever the crew is lifting items > 25 ~~lb~~pounds, working around heavy moveable objects, or there is a risk of falling overhead objects.
- US Coast Guard Type III or IV approved personal floatation device (when working near or over water).
- Long pants and shirts with sleeves (short or long–must cover shoulders; no tank or muscle-shirt styles) Complete the table below for task-specific PPE.

Additional PPE Needed On-Site (to encompass all task specific additions and upgrades)

Face/Eyes	Head/Ears
☐ Spoggles (Safety glasses with foam liner for dust protection) ☐ Welding mask/goggles ☒ Chemical goggles ☐ Face shield (splash) ☐ Face shield (impact)	☒ Helmet with chin strap ☐ Wide-brimmed hat ☐ Earplugs ☐ Over-ear hearing protection
Hands	**Legs/Feet**
☒ Nitrile ☐ Leather ☒ Cut, abrasion, and puncture-resistant ☐ Impact-resistant ☐ Other chemical resistant: _____	☐ High ankle boots ☐ Snake guards ☐ Rubber boots/waders ☐ Metatarsal Guards ☐ Electrically resistant boots

Body	Equipment
☒ Sunscreen ☒ Insect repellent (DEET) ☒ Perme hrin applied to clothing ☒ Long-sleeved shirt ☒ High-visibility vest ☒ High-visibility pants	☐ Air/noise monitoring equipment (specify: ☐ Traffic/Work zone controls equipment (specify): ☒ Communication beyond cell phones (specify: Satellite phone (if cell service does not cover en ire study area); VHF radios

11.0 STUDY AREA CONTROL

The purpose of study area control is to protect the public from inadvertently coming into contact with hazards and to protect AECOM employees being impacted by hazards. This sec ion details the equipment and actions needed to promote optimal study area control.

11.1 ~~S~~STUDY AREA ~~WORK~~ ZONE CONSIDERATIONS~~S~~

Study area layout and study control need to be coordinated to achieve a productive work environment and efficient work process while minimizing exposure of employees and the public to hazards associated with the work.

Consider the following items when planning the study area layout and controls:

- Boat docking/mooring
- Loading/unloading areas
- Boat launching
- "Line of Fire" hazards–overhead utilities, falling/ tipping equipment, release of energy/pressure, flying debris
- Noise, dust, odor suppression
- Contamination containment and decontamination area layout
- Restricted access for areas requiring special training, skills, or certifications
- Overnight safety and security needs

11.1.1 DEFINED WORK ZONES

The exclusion zone, contaminant reduction zone, and support zone for the project activi ies are described below:

~~Work zones aboard sampling vessels are defined as follows:~~

Exclusion Zone:

- Immediately surrounding the sediment collection area. The sediment collection area on the vessel will include a por ion of the deck dedicated to where the collected sediment media and associated equipment are retrieved for the following ac ivities:
  - Sediment trap sampling
  - Surface sediment sampling~~.~~
  - Subsurface sediment sampling

  This will also be the location where the sediment media will be stored on the vessel for transport to the laboratory. ~~.~~This loca ion will be identified during the morning tailgate meeting.

  After all sediment has been collected, the samples will be transported to the processing laboratory. The exclusion zone in the processing laboratory will be the area where sediment samples are processed and stored for shipment to the analytical laboratory.
- Immediate area surrounding the retrieval and collection of porewater samples and associated sampling equipment on the vessel. This will also include the location where porewater samples will be stored until transport to the analy ical laboratory. This will be identified during the tailgate meetings. ~~The exclusion zone is the deck of the sampling vessel and the sample preparation area(s).~~

Contaminant Reduction Zone

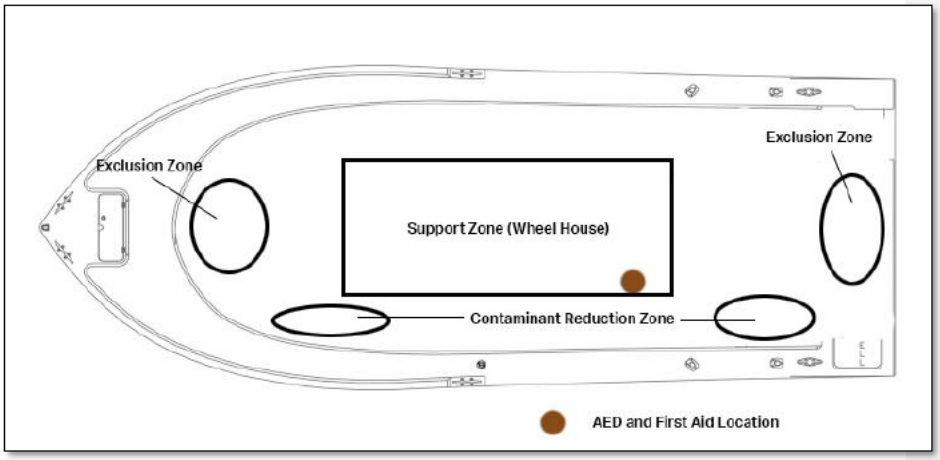
- The contaminant reduction zone is the area where decontamination takes place; the contaminant reduction zone is identified in two locations:

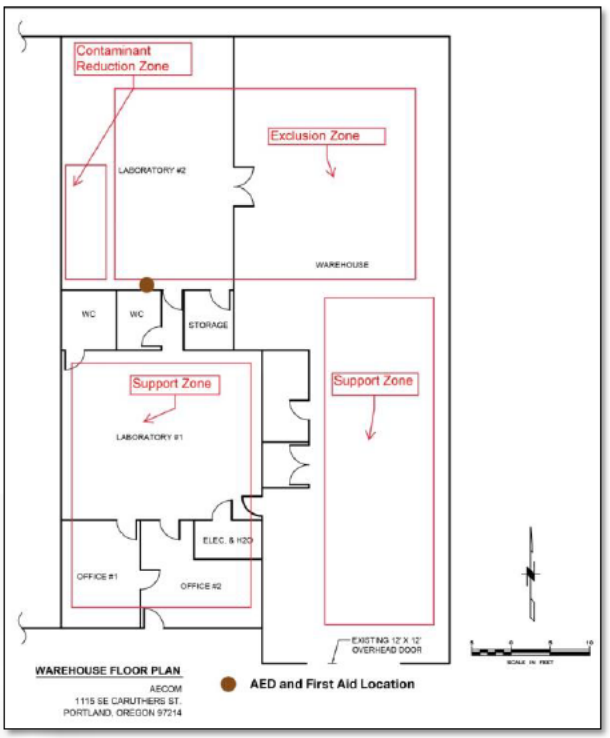
- On the vessel, the immediate area outside the exclusion zone where sampling media is collected and associated equipment (e.g., sediment traps, porewater sampling equipment) are decontaminated.
- In the processing laboratory, the immediate area outside the exclusion zone where sampling of sediment takes place and associated equipment is decontaminated. ~~The contaminant reduction zone is the site per se where decontamination takes place, and~~

Support Zone

- The support zone consists of the following areas:
  - All clean spaces used by the project (e.g., wheel house of sampling vessel). The support zone will include a portion of the deck where visitors may stand and remain outside the exclusion and contaminant reduction zones. The support zone also includes vessels and equipment not involved in sediment sampling.
  - In the processing laboratory, this will include all areas where workers or visitors would not be exposed to contaminants in the exclusion zone or contaminant reduction zone.

The Exclusion Zone, Contaminant Reduction Zone, and Support Zone are illustrated below.





~~The support zone is all clean spaces used by the project.~~

Check the description of the study area controls **already** in place:

☒	The on-shore processing facility is within a facility/property wi h secure and restricted access provided by AECOM.
☐	Work area is enclosed wi hin facility/ property but access is not restricted via locks, guards, or gates
☐	Work area is on a property that is open and access by the public is likely
☐	Work area is on a property that is open but access by the public is unlikely
☐	Work area is in a roadway or right of way of a roadway (Traffic Control Plan required S3AM-306-PR)
☐	Work area is on or near railroad (including right of way, active lines, and crossings)
☒	O her (describe): Work area is on a boat in the Willamette River. Public boaters are likely and crew will cease work if boaters approach closer than 50 feet.

Check and describe he controls hat need to be added to protect the public and the AECOM work team. None applicable.

	Control Item	Description of Type and Application
☐	Fence	
☐	Locks	
☐	Barricades	
☐	Cones	
☐	Tape	
☐	Hole Covers	
☐	O her:	

11.2 SIMULTANEOUS AND NEIGHBORING OPERATIONS

Simultaneous and neighboring operations present a need for added coordination and communica ion to address hazards that are presented by multiple operations.

Activity/Company	Hazard	Controls/Mitigations and~~&~~ Communication methods
Simultaneous Operation (within he study area)		
~~N/~~Portland Harbor is an active port with ship traffic, dock work, ~~A~~and a variety of other activities occurring in the study area	Vessel collisions, disturbance/interference with sampling equipment	The Portland Harbor Harbormaster will be used as a point of contact for coordinating with Simultaneous and Neighboring operations. If there are significant Simultaneous and Neighboring Operations, additional coordination needs will be determined on a case by case basis.
Neighboring Opera ion (outside/ bordering the study area)		
Portland Harbor is an active port with ship traffic, dock work, and a variety of other activities occurring outside and adjacent to the study area~~N/A~~	Vessel collisions during transit to and from study area	The Portland Harbor Harbormaster will be used as a point of contact for coordinating with Simultaneous and Neighboring operations. If there are significant Simultaneous and Neighboring Operations, additional coordination needs will be determined on a case by case basis.

11.3 SECURITY

All projects should be reviewed for the potential for personal security issues (e.g., assault, robbery, threat, etc.). Check all ~~of~~ the following hat apply: N/A

☐ Project located in a higher crime area or has a history of security incidents

☐ Working outside of regular cellular telephone service

☐ Idle property with potential for trespasser(s) to shelter in buildings/structures and assault personnel

☐ Working at night

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12.0 EMERGENCY RESPONSE

AECOM requires hat all projects plan for reasonably foreseeable emergencies (see Emergency Response Planning Procedure S3AM-010-PR). Prior to the start of study implementation, all personnel shall review the table below for specific information regarding evacuations, muster points, communication, and other study area- specific emergency procedures. Rehearsal of he emergency response plan will be conducted as part of ~~Project specific HASP~~HASP Addendum orientations provided prior to the start of work for each field task, during daily safety briefings at regular intervals (at least once per week), when any new AECOM or Subconsultant personnel joins the field team, and whenever there is a change in task or significant change in task location. An Incident Response Flow Chart is included in **Attachment A**.

12.1 INCIDENT/EMERGENCY CONTACT INFORMATION

AECOM Contacts			
Name	**Title**	**Telephone Number**	**Mobile Phone**
Jennifer Pretare	Project Manager	206.438.2175	(b) (6)
Nicky Moody Keith Kroeger Jennifer~~y~~ Pretare	Safety Supervisors and Site Safety Officers (Field Coordinators)	503.478.2765 971.271.5901 206.438.2175	
~~Fred Merrill~~	~~Safety Officer~~	(b) (6)	
Fred Merrill	PNW Area SH&E Manager		
Shelley Brown	Regional SH&E Manager		
Incident Reporting	DCS Incident Repor ing & Help Line	800-348-5046	
AECOM Nurse direct	Use only after incident repor ing line	877-878-9525	
Client Contacts			
Hans Feige	Client Project Manager	503.543.9700	(b) (6)
Organiza ion/Agency			
Police Department (local)			911
Fire Department (local)			911
Ambulance Service (EMT will determine appropriate hospital for treatment)			911
Boating Emergency (U.S. Coast Guard)			Dial 911 or Call the Coast Guard on VHF Marine Channel 16
Oregon Emergency Response System (OERS):			Dial 911 or Call OERS at 800.452.0311
National Response Center (NRS) (as listed on the US Coast Guard Website)			1 800.424 8802
Hospital: Legacy Emanuel Medical Center, 2801 N Gantenbein Avenue, Portland, OR 97227			503.413.2200
Occupational Clinic: Adven ist Health Occupational Medicine, 10201 SE Main Street, Por land, OR 97216			503.408.7010
Poison Control Center			800.222.1222
Pollution Emergency- obtain state spill response number from S3AM-117-ATT1			800.424.8802

	800.348.5046
INFOTRAC (AECOM's account number 74984)	800.535.5053
AECOM Hazardous Material Shipping Help Line	800.381.0664
Public Utili ies	
Call Before You Dig	811

12.2 MUSTER LOCATION

The muster location is in the parking lot at he Swan Island Boat Ramp on North Basin Avenue, Portland, Oregon, 97217, as shown with the pin in the photograph below.

12.3 COMMUNICATION PROCEDURES

Use cell phone, satellite phone, and/or marine radio as appropriate.

12.4 CPR/FIRST AID TRAINED PERSONNEL

CPR/First Aid Trained Personnel that will be on-site will be iden ified in he ~~Project Specific~~ HASP Addendums for each study.

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12.5 INCIDENT REPORTING

Incidents involving or affecting an AECOM employee or subcontractor will be reported in a prompt manner verbally to the Safety Supervisor and Project Manager.

1. If the incident is a significant or life-threatening emergency, the employee or supervisor shall immediately dial 911 or he appropriate emergency ~~conctact~~contact phone number for your location.
2. The employee or supervisor shall contact the Incident Hotline (800-348-5046).
3. The employee or supervisor must notify their operational leaders and the Area SH&E ~~Manager~~Manager.
4. The supervisor, or delegate, must make initial notification in IndustrySafe wi hin 4 hours for significant incidents, or 24 hours for less significant events event.
5. Client and account management no ifications may also apply. The Project Manager will make any necessary notifications.

Any injury, even if no treatment is required, and any incident for which assistance by SH&E Management is needed must be immediately communicated to the Incident Hotline at 1-800-348-5046.

All incidents are also to be reported to IndustrySafe within the timeframes listed below:

Incident Type	IndustrySafe Reporting Time Frame
Significant Incident, including any injury	→ 4 Hours
All Other Incidents	→ 24 Hours

Significant Incidents include:

- Fatality;
- Amputation;
- Hospitalization for treatment for more than 24 hours (admission);
- Any single event resulting in more than one employee requiring medical treatment or more than one employee being away from work more than 3 days;
- Any SH&E-related Consent Agreement/Order/Lawsuit or enforcement action seeking more than
- $10,000 or alleging criminal activity;
- Any spill or release of a hazardous material that is reportable to a regulatory agency;
- Any Notices of Violation resulting from not operating within a regulatory agency permit/license or consent;
- Any incident resulting in property damage expected to exceed $10,000 United States (US) dollars;
- Any security-related incident that could have caused significant harm to an AECOM employee; and/or
- Any Near Miss event that may have resulted in any of the above consequences but because of "luck" did not result in harm to persons, ~~property~~property, or the environment.

All Other Incidents include:

- Any injury or illness to an AECOM employee or subcontractor, even if it does not require medical attention, including work-related injuries/illnesses that have become significantly aggravated by the work environment;
- An injury to a member of the public, or clients, occurring on an AECOM-controlled work area;
- Re-occurring conditions such as back pain or cumulative trauma disorders (e.g., carpal tunnel syndrome);
- Fire, explosion, or flash that is not an intended result of a planned event (e.g., remediation process, laboratory procedure);
- Any incident involving company-owned, rented, or leased vehicles (including personal vehicles used for company business); and/or
- Any failure to comply with the requirements of a regulatory permit issued to AECOM.

Scan the QR code below to access IndustrySafe reporting system from your smartphone/ device.

12.6 MEDICAL EMERGENCIES

In the event of a life-threatening or critical emergency, AECOM employees should dial 911 and follow the recommended instructions. However, in less serious situations, an injured employee or a co-worker should contact the Incident Hotline at 800-348-5046 to ensure that the employee receives the best care at the best time (i.e., within the first hour following an injury or potential injury). By contac ing the Incident Hotline, the worker can be connected with AECOM's nurses for first aid advice. If recommended by the nurse, the supervisor or a co- worker should drive the injured employee to the project-designated clinic or hospital. A map to the designated hospital and clinic is attached as **Attachment A,** and the locations and addresses are included in he table above as well as in the HASP Summary on Page i.

12.7 VEHICLE INCIDENTS

All vehicles should be rented through Carson Wagonlit Travel (accessible via Ecosystem) to ensure that AECOM insurance is included in the rental rate. All other insurances should be declined. AECOM's rental vehicle insurance policy for National/Enterprise or Avis can be found on the DCS Americas United States or Canada travel pages. **Drivers MUST print and carry the applicable insurance policy for the rental**.

In the event of a vehicle incident (including collisions as well as mechanical difficulties such as breakdowns and flat tires) he following responses are recommended:

- For breakdowns and flat tires, contact an emergency provider.
- For rental vehicles, contact the rental company.
- To the extent possible, AECOM personnel should not change flat tires or perform similar repairs.
- If a collision has occurred, assess the situation and move all occupants (except the injured) out of further harm's way. If safe to do so, remove the car from the traveled way. Call 911 if necessary, and

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- Report the incident to the Incident Hotline at 800-348-5046 as soon as practical. If appropriate, wait for police to arrive before moving vehicles. Provide insurance information to other drivers if necessary or requested and collect the same. If possible, obtain names and phone numbers of witnesses. Take photographs of the scene if possible. DO NOT ADMIT LIABILITY, AGREE TO PAY FOR DAMAGE, OR SIGN A DOCUMENT RELATED TO AN INCIDENT EXCEPT AS REQUIRED BY LAW.
-

12.8 SPILL OR RELEASE

AECOM employees or subcontractors are not expected to take action or to par icipate in rescues or responses to chemical releases (including of petroleum products) beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911), unless here is a contractual provision for this response and specially trained employees.

12.8.1 Environmental Spill/Release Reporting

All environmental spills or releases of hazardous materials (e.g., fuels, solvents, etc.), whether in excess of the Reportable Quantity or not, will be reported according to the incident reporting procedure. If any event occurs in the performance of the PDI field work that causes or threatens to cause a release of Waste Material on, at, or from the Site and that ei her cons itutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Respondents shall:

1. Iimmediately take all appropriate action to prevent, abate, or minimize such release or threat of release ;
2. Iimmediately notify the authorized EPA officer orally; and.
3. Ttake such actions in consultation with authorized EPA offierofficer in a safe manner with respctrespect thetto the appropriate level of training for the worker(s) and applicable provisions of the Heal h and Safety Plan.

The Oregon Department of Environmental Quality requires the following spills be reported:

- Spill reporting includes any amount of oil (oil basedoil-based fluids) to waters of the state ;
- Oil spills on land in excess of 42 gallons.
- Hazardous materials that are equal to the quantities provided in Table 12.2, below ;

The following numbers must be called in the event of a release:

The Oregon Emergency Response System:	1-800-452-0311
The National Response Center:	1-800-424-8802
The EPA Project Coordinator (or if he/she cannot be reached) the EPA Emergency Response Unite for Region 10	206-553-7660XXX-XXX-XXXX (project coordinator – David Zhen) 206-553-1263 (project coordinatoremergency response unit)

~~In determining whether a spill or release must be reported to a regulatory agency, the Safety Supervisor or qualified worker will assess he quantity of the spill or release and evaluate the reporting criteria against the state-specific reporting requirements, applicable regulatory permit, and/or client-specific repor ing procedures. If reporting to a US state or Federal regulatory agency is required, AECOM has 15 minutes from the time of the spill/release to officially report it.~~

Table 12.2- CERCLA Reportable Quantities

Hazardous Substance	Regulatory Synonyms	Final Reportable Quantity (pounds)
1,1,1-Trichloroethane	TCA	1,000
Arsenic	N/A	1
Benzene	N/A	10
Cadmium	N/A	10
Carbon Tetrachloride	N/A	10
Chromium	N/A	5 000
Ethyl Benzene	N/A	1 000
Lead	N/A	10
Mercury	N/A	1

Hazardous Substance	Regulatory Synonyms	Final Reportable Quantity (pounds)
Methyl E hyl Ketone	MEK	5,000
Nickel	N/A	100
Pentachlorophenol	PCP	10
Selenium	N/A	100
Tetrachloroethylene	Perchloroethylene, PCE	100
Toluene	N/A	1,000
Trichloroethylene	Trichloroethene, TCE	100
Xylene	N/A	100

To the best of the team's ability be ready with the following information:

- Where is the spill?
- What was spilled?
- How concentrated is the spilled material?
- Who spilled the material?
- Is anyone cleaning up the spill?
- Are there resource damages (e.g. impacted wildlife)?
- Who is reporting he spill?
- How we can get back to you?

~~Chemical specific Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quanti ies for the known chemicals on site are shown in the table below.~~

~~CERCLA Reportable Quantities~~

~~Hazardous Substance~~	~~Regulatory Synonyms~~	~~Final Reportable Quantity (pounds)~~
~~1,1,1 Trichloroethane~~	~~TCA~~	~~1,000~~
~~Arsenic~~	~~N/A~~	~~1~~
~~Benzene~~	~~N/A~~	~~10~~
~~Cadmium~~	~~N/A~~	~~10~~
~~Carbon Tetrachloride~~	~~N/A~~	~~10~~
~~Chromium~~	~~N/A~~	~~5,000~~
~~Ethyl Benzene~~	~~N/A~~	~~1,000~~
~~Lead~~	~~N/A~~	~~10~~
~~Mercury~~	~~N/A~~	~~1~~
~~Methyl E hyl Ketone~~	~~MEK~~	~~5,000~~
~~Nickel~~	~~N/A~~	~~100~~
~~Pentachlorophenol~~	~~PCP~~	~~10~~
~~Selenium~~	~~N/A~~	~~100~~
~~Tetrachloroethylene~~	~~Perchloroethylene, PCE~~	~~100~~
~~Toluene~~	~~N/A~~	~~1,000~~
~~Trichloroethylene~~	~~Trichloroethene, TCE~~	~~100~~
~~Xylene~~	~~N/A~~	~~100~~

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CERCLA Reportable Quantities can be found at: http://www.epa.gov/oem/docs/er/302table01.pdf

The spill containment program addresses the following site-specific information:

- Potential hazardous substance spills and available controls;
- Initial notification and response;
- Spill evaluation and response; and
- Post-spill evalua ion.

12.8.2 Spill Evaluation and Response

The Safety Officer is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated to he extent possible. When an incidental release occurs, clean-up personnel will receive instructions in a pre-clean-up meeting as to spill conditions, PPE, response activities, decontamination, and waste handling.

The procedures of the Emergency Response section of this HASP will be immediately implemented when the spill is determined to require emergency precautions and action. If necessary to protect those outside the clean-up area, notification of the appropriate authorities will be made. The table in Section 12.8.1 lists the spill conditions that trigger notification of federal, state, and local agencies.

The following are general measures that response/clean-up personnel shall take when responding to a spill:

- To minimize the potential for a hazardous spill, hazardous substances, control/absorbent media, drums and containers, and other contaminated materials will be properly stored and labeled.
- When a spill occurs, only those persons involved in overseeing or performing spill containment operations will be allowed within the designated hazard areas. If necessary, the area will be roped or otherwise blocked off. Unauthorized personnel will be kept clear of he spill area.
- Appropriate PPE will be donned before entering the spill area.
- Appropriate spill control measures will be applied during spill response.
- Whenever possible without endangerment of personnel, the spill will be stopped at the source or as close to the source as possible.
- Ignition points will be removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked or surrounded by berms to exclude the spilled waste and any materials applied to it.
- Provisions will be made to contain and recover a neutralizing solution, if used.
- Small spills or leaks from a drum, tank, or pipe will require an evacuation to a safe distance in all directions to allow clean-up and to prevent employee exposure. For small spills, sorbent materials such as sand, sawdust, or commercial sorbents (see Table below for sorbent media) will be placed directly on the spill to prevent further spreading and aid in recovery. The table below provides guidance to potentially spilled material, what will be available to contain or clean the spill, and where the material is located.

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Typical Spilled Media and Containment Material

Spilled Media	Spill Containment Material	Where Spill Containment Kits are Located
Fuel spill on water	Absorbent socks and booms	On Vessel
Sediment spill	Absorbent socks and booms	In drum storage area

- Spill area will be sprayed with appropriate foam where the possibility of volatile emissions exists.
- If the spill results in the forma ion of a toxic vapor cloud, from vaporization, reaction with surrounding materials, or he outbreak of fire, further evacuation may be required.
- To dispose of spill waste, all contaminated sorbents, liquid waste, or other spill clean-up will be placed in approved 55-gallon drums for proper storage or disposal as hazardous or non-hazardous (depending on media) waste.

12.8.3 Post-Spill Evaluation

As part of he incident investigation and reporting documentation, a written spill response report shall be prepared at the conclusion of clean-up operations. The report will include, at a minimum, the following information:

- Date of spill incident
- Cause of incident
- Spill response actions
- Any outside agencies involved, including their incident reports
- Lessons learned or suggested improvements

The spill area will be inspected to ensure the area has been satisfactorily cleaned. The use of surface and air sampling will be utilized in his determination as necessary. The root cause of he spill will be examined and corrective steps taken to ensure the engineering and control measures in place have performed as required. If alternative precau ions or measures are needed, they will be made available and implemented.
All durable equipment placed into use during clean-up activities will be decontaminated for future utilization. All spill response equipment and supplies will be re-stocked as required.

12.9 FIRE

AECOM employees are not expected to attempt to put out fires. Stop work, notify all AECOM personnel, move upwind, and contact 911 and/or emergency response at he study area. If employees have been properly trained in the operation of a fire extinguisher, they may attempt to put out a small fire, provided that the following conditions are met:

The fire must be small (i.e., smaller than a trash can) and in its early stages.

- The employee must have an escape route.
- The employee must be trained and know they have the right type of extinguisher.
- The employee must be safe from toxic gases.
- There must be no hazardous conditions that could quickly accelerate the fire (i.e., presence of chemicals, especially dry grass, etc.).
- Above all, if in doubt, the employee must not attempt to fight the fire.

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13.0 –PERSONNEL ACKNOWLEDGEMENT

By signing below, the undersigned acknowledges that he/she has reviewed the AECOM Health and Safety Plan for the Portland Harbor PDI Studies. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein. The employee understands that they are NOT to perform any work that they have not been adequately trained for and that they are to stop work if it is unsafe to proceed. Finally, the employee understands to notify the Safety Supervisor and the Incident Hotline at 800-348-5046 for any incident, ***including ANY injury even if no first aid or medical treatment is required.***

PRINT NAME	SIGNATURE	ORGANIZATION	DATE

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Attachment A

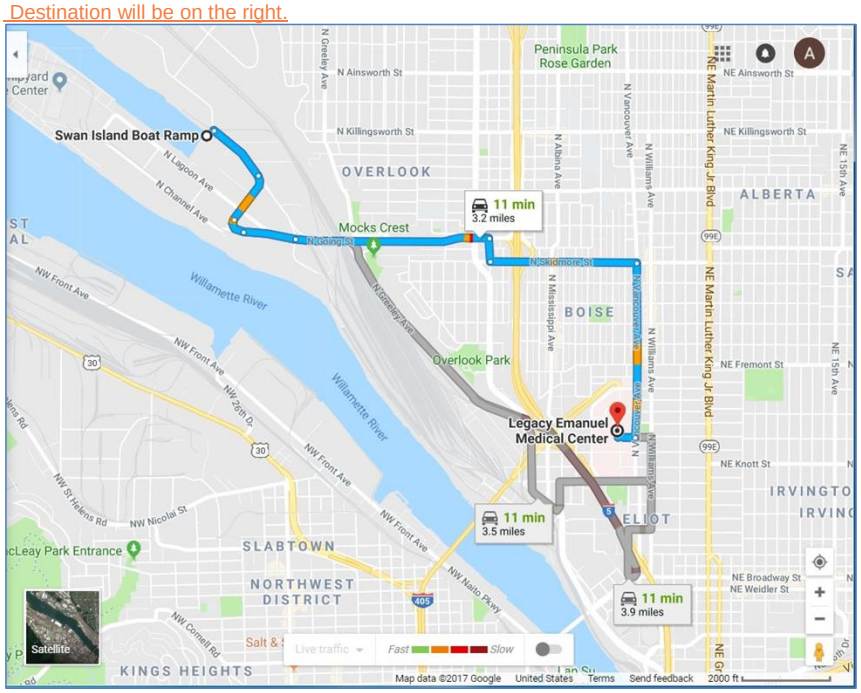
Hospital and Clinic Directions/ Maps
Incident Reporting and Response Flow Chart

Hospital Location Maps

Legacy Emanuel Medical Center
2801 N Gantenbein Ave
Portland, OR 97227

503-413-2200

From Swan Island Boat Ramp:
1) Head southeast on N Basin Ave toward N Emerson St
2) Continue onto N Anchor St
3) Use any lane to turn slightly left to stay on N Anchor St
4) Continue straight onto N Channel Ave
5) Continue onto N Going St
6) Turn right onto N Maryland Ave
7) Turn left onto N Skidmore St
8) Turn right onto N Vancouver Ave
9) Turn right onto N Stanton St
Destination will be on the right.

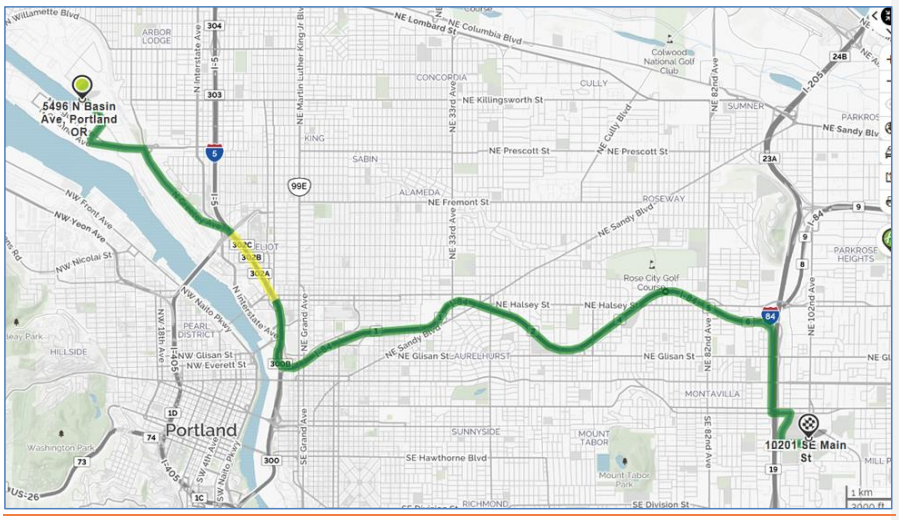


Hospital Location Maps (continued)

Adventist Health Occupational Medicine
10201 SE Main Street
Portland, OR 97216

503-408-7010

From Swan Island Boat Ramp:
1) Head southeast on N Basin Ave toward N Emerson St
2) Stay straight to go onto N Anchor St
3) Keep left at the fork to continue on N Anchor St
4) Turn slight left onto N Channel Ave
5) N Channel Ave becomes N Going St
6) Turn slight right onto ramp
7) Merge onto N Greeley Ave
8) Merge onto I-5/Pacific Hwy 1 S toward Salem
9) Merge onto I-84 E/US-30 E via Exit 301 toward The Dalles
10) Take Exit 6 toward Salem
11) Keep right to take the Glisan St/Stark St ramp
12) Turn left onto SE Washington St
13) Turn right onto SE 99th Ave
14) Turn left onto SE Main St
15) Your destination is on the left.



AECOM

Work-Related Incident Flowchart for Employees | Updated October 2016

DCS - Americas

NOTE: The direct number to AECOM nurses, 1-877-878-9525, is active and can be used by employees. However, the AECOM SH&E team prefers that employees call the AECOM Incident Reporting Hotline. The Hotline will route all medical cases to AECOM nurses, AND they will trigger text messages directly to the SH&E team.

* Supervisor or Responsible Manager will initiate Client or Site Notification Process as appropriate

** If injured person is an AECOM subcontractor, call AECOM's nurses at 877-878-9525, or direct sub to their own provider.

*** For all AECOM vehicles, call Element at 1-800-446-7052.

Updated October 2016

Attachment B

AECOM SH&E Field Applicable Procedures

Attachment C

Project and Activity Orientation Outline

AECOM will conduct a safety briefing for a person's initial visit to the study area. The briefing will be conducted:

- Prior to the start of work;
- For any new AECOM or subconsultant personnel; and
- At each mobilization, or whenever there is a change in task or significant change in task location.

All personnel working on the project who have received the briefing (including the HASP review) will sign the Personal Acknowledgement located at the end of the HASP. Visitors may receive a shortened version to address the hazards specific to their visit.

The following items, at minimum, will be discussed during the safety briefing:

- Contents of his HASP;
- The Emergency Response Plan;
- Contractor SH&E Management expectations;
- Injury management, including notification and hospital and occupational clinic locations;
- The AECOM 4-Sight program;
- Stop Work authority;
- The JSAs (Attachment E) for the tasks that will be performed on a given job;
- Completion of a THA each day (Attachment E);
- Types of hazards at the study area and means for minimizing exposure to them;
- Instructions for new operations to be conducted, and safe work practices;
- PPE that must be used;
- Lone worker check-in procedures;
- Emergency evacuation routes, muster points, and tornado/storm shelters; and
- Location and use of emergency equipment.

These mee ings must be documented and maintained in the project files.

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Attachment D

Project/Task-Specific Pre-Job Hazard Assessments or Job Safety Analysis

Attachment E

Daily Task Hazard ~~Analysis~~Assessment/Daily Tailgate Forms

AECOM

Americas

Task Hazard Assessment

S3AM-209-FM6

Date:	Project Name / Location:
Permit / Job Number:	Project Number:
Description of Task:	

Do you have a pre-job hazard assessment (JHA) specific to this task in your hands?

- ○ **Yes** – review the steps, hazards, and precautions. Attach and reference JHA in the form below. Add any additional steps, hazards, and precautions to this form otherwise unidentified on JHA.
- ○ **No** – list all steps, hazards, and precautions associated with the task in the form below.

Basic Task Steps (explain in order how the task will be carried out)	Hazards (identify all hazards & potential hazards of each step)	Risk (before)	Control Measures / Precautions (describe how that hazard will be controlled)	Risk (after)	Revised? (yes – record time)
			Highest Risk Index		

The Task Hazard Assessment is to be completed at the worksite by the individual(s) who is intended to conduct the task immediately prior to initiating the associated task. Number and attach additional pages if necessary.

Worker/Visitor acknowledgement and review of this content on back of this document. Originator to also sign Worker acknowledgement section.

Originator _____ (Print Name) _____ (Signature)

Supervisor _____ (Print Name) _____ (Signature)

Risk Matrix on Reverse

THIS FORM IS TO BE KEPT ON JOB SITE.

AECOM

WORKER SIGN ON

NAME (Please Print) TIME SIGNATURE

I participated in the development and understand the content of this Task Hazard Assessment.

Task Hazard Assessment Follow-Up/Review

Initials/Time	Initials/Time	Initials/Time

VISITOR SIGN ON

I have read and understand the content of this Task Hazard Assessment.

Instructions:
Identify basic steps of the task and associated hazards. Calculate the initial risk rating. Identify control measure to eliminate or reduce the hazard's risk and calculate the residual risk rating. If the risk rating (after controls are implemented) cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin.

Employees shall monitor the activities for compliance with this document. Workers should **STOP WORK** on a task if conditions change from the planned and agreed approach to the work.

This document should be updated to reflect new conditions or changes in task methods.

Emergency Meeting / Assembly Area

Emergency Contact #

Method of Communication

Risk Rating Matrix

Probability	Severity: 5 – Catastrophic	4 – Critical	3 – Major	2 – Moderate	1 – Minor
5 – Frequent	25	20	15	10	5
4 – Probable	20	16	12	8	4
3 – Occasional	15	12	9	6	3
2 – Remote	10	8	6	4	2
1 – Improbable	5	4	3	2	1

Risk Rating (Probability x Severity)	Risk Acceptance Authority
1 to 4 (Low)	Risk is tolerable, manage at local level
5 to 9 (Medium)	Risk requires approval by Operations Lead/Supervisor & SH&E Manager
10 to 25 (High)	Risk requires the approval of the Operations Manager & SH&E Director

Severity – Potential Consequences

	People	Property Damage	Environmental Impact	Public Image/Reputation
Catastrophic	Fatality, Multiple Major Incidents	>$1M USD, Structural collapse	Offsite impact requiring remediation	Government intervention
Critical	Permanent impairment, Long term injury/illness	>$250K to $1M USD	Onsite impact requiring remediation	Media intervention
Major	Lost/Restricted Work	> $10K to $250K USD	Release at/above reportable limit	Owner intervention
Moderate	Medical Treatment	> $1K to $10K USD	Release below reportable limit	Community or local attention
Minor	First Aid	<=$1K USD	Small chemical release contained onsite.	Individual complaint

Probability

Frequent	Expected to occur during task/activity	9/10
Probable	Likely to occur during task/activity	1/10
Occasional	May occur during the task/activity	1/100
Remote	Unlikely to occur during task/activity	1/1,000
Improbable	Highly unlikely to occur, but possible during task/activity	1/10,000

Attachment F

~~SPILL RESPONSE DIRECTIVE~~AED Program